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Treatment of Shock from War Injuries*

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THE subject of shock is arousing so much interest that to review even the recent publications in this paper is impossible. In a monograph[22] on shock published only five months ago the author reviewed the subject and cited over 800 references to it, most of which had appeared in the preceding five years. Since that time the American and the British medical press have been especially replete with new advancements concerning shock. At the present time I will attempt to discuss only four of the most recent developments in the field. These are, in brief:

1. The use of oxygen in shock treatment.
2. The use of adrenal cortical extract in shock treatment.
3. Newer blood substitutes, and
4. Special advances in the treatment of burn shock.

Recent reviews on shock include those of Harkins,[21,22,23,25,26,27] Riley,[56] Adams,[1] McMichael,[45] Dunphy and Gibson,[12] and Bowers.[7] A useful working definition of shock is the following:

Shock is a progressive vasoconstrictive oligemic anoxia.

The Use of Oxygen in Shock Treatment

One of the reasons for irreversibility of the shock syndrome is anoxic damage to tissues. The importance of anoxia has been emphasized by Hartman, McClure and their associates.[31,44] It is essential to use early prevention and continued treatment to prevent tissue injury. The importance of oxygen administration in shock has been stressed by Wood, Mason, and Blalock (1940);[72] Schnedorf and Orr (1941);[59,60] Schnedorf, Lorhan, and Orr (1941);[58] and by Willson (1941).[70]

Davis (1941)[9] recently carried out an investigation concerning the effects of oxygen administration to animals with different types of shock. Although benefits were obtained, the results were not uniform and Davis concluded: "Administration of oxygen should be regarded merely as a subsidiary form of treatment in cases of shock. The best results are obtained before a considerable diminution in the blood volume has occurred, regardless of whether shock is associated with hemodilution or with hemoconcentration. The administration of oxygen is useless in cases of severe shock if the blood volume continues to decrease. If the blood volume is low but no further decrease occurs, oxygen may have the effect of stabilizing the low blood pressure and preventing its further fall until other forms of therapy are available."

Mutch (1940)[54] analyzed methods of oxygen administration. He states that the tube and funnel method did not appreciably raise the oxygen content of the alveolar air. The other three methods in common use: nasal catheters, tents, and the B.L.B. mask effect a considerable rise in the alveolar oxygen. Mutch points out that

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for simplicity in remembering, the alveolar oxygen percentages attained are multiples of 15 as follows:

Normal	15
Nasal catheters	30
Tent (usual)	45
Tent (extreme)	60
B.L.B. Mask	90

It is to be pointed out that nasal catheters depend on a ration system and the supply of oxygen is not at all dependent on the demand. In fact, as the demand increases, the alveolar oxygen percentage decreases. On the other hand, both the oxygen tent and the B.L.B. mask enable oxygen to be regulated to meet the demand rather than be limited to a fixed ration. Where only a small amount of oxygen is needed, nasal catheters attached to a Tudor-Edwards spectacle frame are of value. In more serious cases tents or masks are indicated.

The Use of Adrenal Cortical Extract in Shock Treatment

It is well known that cortex of the adrenal gland is essential to life and that animals with a deficient adrenal cortex are unusually susceptible to procedures that commonly produce shock. The converse of these ideas, namely, the use of adrenal cortical hormones in the treatment of shock, rests on a less firm foundation. This subject has recently been reviewed by Harkins (1941),[22] in an editorial in the *Journal of the American Medical Association* (1941),[13] by Loeb (1941),[41] by Kendall (1941),[37] and by Selye, Dosne, Bassett and Whitaker (1940).[61] As Kendall points out, there are several compounds present in the adrenal cortex with varying and at times opposing actions. These include desoxycorticosterone, corticosterone, compound E and others. Whole gland extracts may have these compounds present in varying amounts whereas the synthetic desoxycorticosterone represents only one of them. Before the treatment of shock with these substances can be put on a rational basis, it would be advantageous for physicians to state more definitely which substances were used rather than to loosely group them together under the term "adrenal cortical hormone."

While this phase of the therapy of shock is still in the experimental stage, it offers much promise. The recent report of Rhoads, Wolff, and Lee (1941)[55] on the use of adrenal cortical extract in the treatment of burn shock is especially encouraging.

The recent article of Besser (1941)[3] is of interest because it casts doubt on the value of desoxycorticosterone acetate in the prevention of operative surgical shock. Besser gave seventy-two patients seen at the University of Iowa Hospitals pre-operative desoxycorticosterone acetate in adequate doses (15 to 30 or more mgm. in the twelve-hour period immediately preceding operation). In this group of seventy-two patients which included serious operations, especially thoracoplasties, lobectomies, pneumonectomies, gastric resections, intestinal operations, and colectomies, twenty-three patients (31 per cent) developed shock. In a similar untreated group of sixty-eight cases following equally serious operations, only twenty-seven (29 per cent) developed shock. Besser concluded that a comparison of these two series indicated little significant difference. In so far as clinical cases are concerned, this study would tend to discredit the value of pre-operative desoxycorticosterone acetate.

Newer Blood Substitutes

Numerous blood substitutes have been suggested, tried and abandoned. The chief ones as used at the present time are listed in Table 1. Taylor and Waters (1941)[66] emphasized very strongly that the maintenance of blood volume is the chief requisite in the treatment of shock due to hemorrhage. They stated: "It has been amply proved that the prime requirement in hemorrhage is to fill the vessels and so maintain the blood pressure. Compared with the reduction in the volume of the blood the loss of red cells is of very secondary importance as an immediate threat to life."

Recent reviews all appearing within the past five months of the use of blood substitutes in wartime include those of Sturgis,[65] Blalock and Mason,[6] Harkins and McClure,[27] and Schaefer.[57]

1. *Blood Itself.*—Blood still remains one of the best substances to replace blood that is lost. Important references on the subject of blood transfusion have appeared during the past six months.[2,8,10,11,14,19,20,35,36,42,43,50,51,52,62,67,69,71] The article by Yott (1940)[73] should also be consulted.

TABLE I. LIST OF BLOOD SUBSTITUTES

1. Blood itself.
2. Water.
3. Crystalloids: saline, glucose, Ringer's or Locke's solution.
4. Gum acacia and gelatin.
5. Ascitic fluid.
6. Red cell solution.
7. Hemoglobin — Ringer solution.
8. Plasma — normal or concentrated, natural or reconstituted dried, and human or bovine.
9. Serum — natural or reconstituted dried.
10. Casein digestate.
11. Isinglass solution (7 per cent).
12. Pectin solution (1 per cent).

2. *Water*—This substance has little value for intravenous use but adequate maintenance of water balance should always be striven for in shock cases.

3. *Crystalloids.*—The transitory effect of these substances is best epitomized by quoting from the recent article of Taylor and Waters (1941)[27] who recognized the transitory effects of saline infusion in shock, stating: "It diffuses freely from the vessels; any rise in pressure which does follow the transfusion of saline is therefore very evanescent."

4. *Gum Acacia and Gelatin.*—Gum acacia and gelatin were introduced during the first World War. The former substance has the disadvantages that it is antigenic and that it leads to more or less permanent deposits in the liver.

5. *Ascitic Fluid.*—This fluid is used chiefly in Russia[15] and in New Orleans[51] and its administration is still in the experimental stage although it has been used successfully in patients by Maes and Davis.[47]

6. *Red Cell Solution.*—This solution is chiefly of value in cases associated with severe anemia.

7. *Hemoglobin — Ringer's Solution.* — If preliminary alkalinization of the urine is not adequately carried out, blockage of the renal tubules is apt to result.

8. *Plasma.*—One of the best recent reviews on the use of plasma as a blood substitute is that of Mahoney, Kingsley, and Howland (1941).[48] Keys, Taylor, and Savage (1941)[38] reported on the use of animal plasma. Other reports of value have appeared in the past six months.[5,18,28,30,34,40,46,49,53,63,64,68] The method of Hartman (1940)[32] of drying plasma in cellophane cylinders (the rotor pervaporator) has an important wartime application because of its cheapness, ease of keeping the plasma sterile, rapidity, and ready application to mass production.

9. *Serum.* — Serum is favored in England while plasma is preferred in this country. Serum has the advantage of not developing fibrin deposits on standing as does plasma, while plasma is supposed to give less reactions and can be obtained from the blood that has been standing in blood banks. Recent articles on serum include those of Levinson and Wolf (1941),[39] Harrison and Picken (1941),[29] and an editorial in the *Lancet* (1941).[16]

10. *Casein Digestate.* — Casin contains all of the eleven essential amino acids and has been used intravenously as discussed by Harkins.[22]

11. *Isinglass.*—The use of isinglass as a blood substitute was introduced by Taylor and Waters (1941)[41] of Toronto. Isinglass is in reality fish gelatin and is obtained from sounds or swimming bladders of various species (sturgeon, hake, sea trout and others) and is used commercially chiefly by the brewing industry. When purified by the special process of the Toronto workers and used as a 7 per cent solution in buffered 0.9 per cent sodium chloride, it fulfilled rather rigid specifications of a transfusion fluid. It is readily soluble, lacks toxicity and is readily sterilized by boiling without decomposition. The final product is a perfectly clear pale yellow solution. Taylor and Waters concluded that "isinglass in saline is capable of restoring the blood pressure after it has been lowered by hemorrhage and of saving the lives of animals which, had no treatment been instituted, undoubtedly would have died. These animals made a complete and uneventful recovery." There are no published reports of the use of isinglass in human shock cases.

12. *Pectin.* — This substance has the advantage that if it proves to be a satisfactory blood substitute it can be obtained from fruit by the ton. This ready availability would be of immense value in case of war. The idea of using pectin as a blood substitute was originated by Dr. F. W.

Hartman and research work on its experimental and clinical application was carried out by Hartman in collaboration with Schelling, Harkins, and Brush.[33] At the present time pectin solution has been used successfully as a blood substitute in over thirty clinical cases.

CALCULATION OF PLASMA DOSAGE DURING FIRST WEEK AFTER BURN. (CASE - B. S.)

DATE	2-11-41 (AM)	2-11-41 (PM)	2-12-41	2-13-41	2-14-41	2-15-41	2-17-41
HEMATOCRIT	57	62	56	52	49	40	36
HEMOGLOBIN (CALCULATED FROM HEMATOCRIT)	126	137	124	115	109	89	80
PLASMA PROTEIN (Gm./100cc.)	7.5	7.0	8.1	5.9	6.0	5.9	5.7
1. CALCULATED PLASMA DOSAGE: METHOD OF ELKINTON, *et al.*	1250cc.	1760cc.	970cc.	1290 cc.	970cc.	20 cc.	−460 cc. (EXCESS)
2. CALCULATED PLASMA DOSAGE: METHOD OF BLACK.	1040cc.	1350cc.	970cc.	650cc.	410 cc.	−620 cc. (EXCESS)	−1250 cc.
3. CALCULATED PLASMA DOSAGE: FORD HOSPITAL FORMULA	1200cc.	1700cc.	1100cc.	700cc.	400cc.	0	0
ACTUAL AMOUNT OF PLASMA GIVEN (AFTER READINGS)	300cc.	1200cc.	700cc.	0	0	0	0

Fig. 1. A comparison is made between the calculations of plasma dosage by the two more complicated formulas (1 and 2 above) with the author's method (3 above). It is seen that the agreement is fairly good. In the last horizontal column the actual amount of plasma given is shown.

The pectin is obtained from manufacturers as a powder which is made into a 0.75 per cent buffered solution. The viscosity and osmotic pressure of some samples are even slightly greater than those of plasma. As the material is manufactured without bacterial action such as may occur with acacia and the solution may later be sterilized by autoclaving, it is not only sterile, but pyrogen free. While pectin is temporarily taken up by the liver, it is not permanently retained in that organ as is acacia. In fact after 14 hours no evidence of hepatic retention was found in experimental animals. The temporary character of the body's retention of pectin is further demonstrated by its excretion in the urine. Absolute alcohol precipitation tests on urine indicate that the excretion of pectin is small during the first eight to 12 hours after the injection, but reaches a maximum within 24 hours, and within 48 to 72 hours the major portion of the pectin is eliminated unchanged.

Examinations of the liver, kidneys and other organs of animals receiving pectin intravenously showed no evidences of toxicity. Since pectin is a complex colloidal carbohydrate of high molecular weight, one would not expect it to have antigenic properties and experiments bore out this supposition, revealing no evidences of anaphylaxis.

Pectin was given to a series of animals with shock produced by (a) hemorrhage, or (b) bile peritonitis and seemed about as useful as whole blood in combatting the resultant shock. In other dogs plasmapheresis was done and the plasma replaced by pectin. In these experimental animals, amounts of pectin corresponding to over three liters in an average sized man were rapidly injected with benefit to the blood pressure and shock condition.

One of the big advantages of pectin over plasma, in addition to the relatively unlimited supply, is the ease of sterilization and preservability. These two factors combine to make it especially useful in wartime. The fact that the pectin is excreted within thirty-six hours would tend to make one believe that it would be of only temporary value. It is a well known and established fact, however, that the bulk of shock cases will recover if they can be tided over that most serious first thirty-six-hour period. The pectin is of value then when it is most needed and its later excretion is probably an advantage rather than a disadvantage.

Special Advance in the Treatment of Burn Shock

Because an average of 6,000 persons die from burns in the United States every year and because 60 to 75 per cent of these die from burn shock, this subject is of extreme significance even in peacetime. The usual treatment of shock is of value, including oxygen and adrenal cortical extract, but the use of substances to replace the plasma that is lost at the site of the burn is of especial importance.

Since plasma rather than whole blood is lost in burns, administration of the former best sup-

plies the deficiency. In the past year three methods of calculating the amount of plasma to be given have put the entire subject on a quantitative basis. These three methods are as follows and as shown in Figures 1 and 2:

a. *The method of Harkins (1941).*[24] — This method is the simplest of the three and is *to give 100 c.c. of plasma for every point the hematocrit is above the normal of 45.* This method applies to adults and involves the assumption that the patient's pre-burn hematocrit was normal. This assumption is also inherent in the other two methods. For children the amount of plasma is calculated proportionately according to body weight, with the average adult weight set as 70 kilograms. If the plasma protein level is below normal, this method gives too low a value. In such a case an additional 25 per cent of the calculated amount of plasma should be added for every gram the protein level is below 6.0 gm. It is noteworthy, however, that a hypoproteinemia seldom occurs in an adequately treated burn case and hence this correction seldom has to be applied.

b. *The Method of Black (1940).*[4]—This method is used in England and uses the following formula:

X = amount of plasma to be given in c.c.

$$X = \left(5 - \frac{500}{Hb_2}\right) 1000,$$ where Hb_2 is the hemoglobin observed after the burn

c. *The Method of Elkinton, Wolff, and Lee (1940).*[17]—This method uses a more complicated formula and takes account of both hemoconcentration and possible low plasma proteins.

Y = amount of plasma to be given in gm.

$$Y = 3.5\ W - \frac{W\ (100-Ho)\ HnPo}{2(100-Hn)\ Ho},$$ where

W = body weight in Kgm.
Ho = observed hematocrit
Hn = normal hematocrit (=44)
Po = observed plasma protein in gm./100 c.c.

This formula can be simplified from this unwieldly form by substituting the normal hematocrit — since this has to be done anyway — and by expressing the result in c.c. of plasma to be given instead of in grams (since donor's plasma is never analyzed quantitatively anyway).

X = amount of plasma to be given in c.c.

$$X = 49\ W - \frac{5.5\ (100-Ho)\ Po\ W}{Ho}$$

An illustrative case treated at the Henry Ford Hospital will be cited with a comparison of the results of the three methods of calculation of plasma dosage.

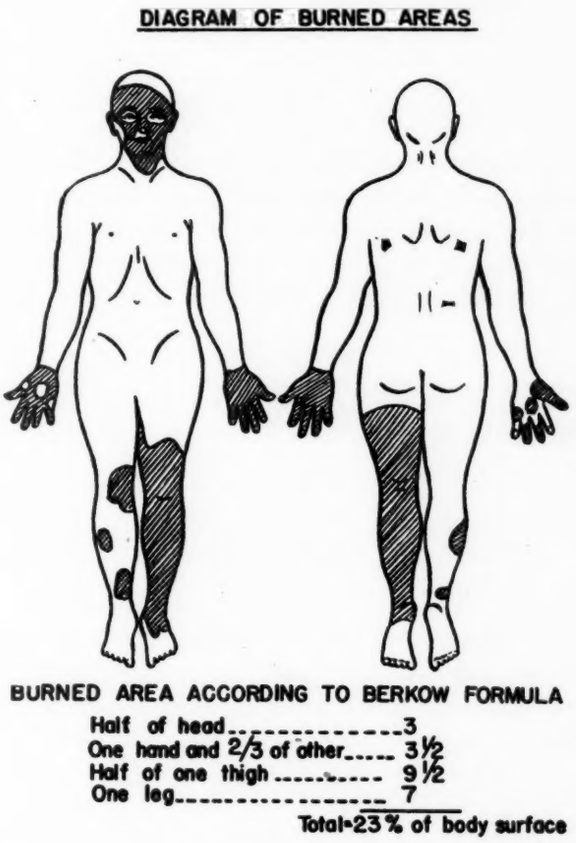
DIAGRAM OF BURNED AREAS
BURNED AREA ACCORDING TO BERKOW FORMULA
Half of head 3
One hand and 2/3 of other 3½
Half of one thigh 9½
One leg 7
Total=23% of body surface

Fig. 2. Diagram of the burned areas in patient M. K. Actual measurement after skin grafting showed the area grafted (which was less than that burned) to be 1.73 square feet.

Patient M. K., male, aged thirty-eight years. Severe gasoline burns of lower extremities covering 20 per cent of body surface (1.73 square feet).

Observed initial hematocrit after burn = 60 per cent.
Observed initial plasma protein = 6.68 gm.
Wgt. of patient = 80 kgm.
2,000 c.c. plasma given in twelve hours.
New hematocrit = 45 per cent (normal).
New plasma protein = 6.49 gm.
No further plasma needed.

The patient never showed any sign of shock and left the hospital completely recovered after several skin-grafting procedures.

Results of Formula Calculations:

a. Method of Writer

Hematocrit is 15 points above normal of 45, and plasma protein is above 6.0 gm.; therefore, 1,500 c.c. plasma needed.

b. Method of Black

Hematocrit 60 approximately corresponds to 132 hemoglobin:

$$X = \left(5 - \frac{500}{132}\right) 1000 = 1210 \text{ c.c. plasma needed.}$$

c. Method of Elkinton

$$X = 49 \times 80 - \frac{5.5 \times 80 \times 40 \times 6.68}{60}$$

$$= 1960 \text{ c.c. plasma needed.}$$

It is thus seen that the three methods agree rather well for the examples cited. The method of the author, however, is by far the simplest and thus is more practical and more applicable at the bedside and in the clinic.

Conclusions

1. The three modern developments in the treatment of shock that are most worthy of attention are the use of:

   a. Oxygen.
   b. Adrenal cortical extract.
   c. Blood substitutes.

2. Among the blood substitutes, plasma and pectin solution are especially promising from both the standpoint of peacetime and wartime use.

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MSMS

ANNUAL MICHIGAN POSTGRADUATE PROGRAM FOR GRADUATES IN MEDICINE

Upper Peninsula Program May 25-30

Houghton Ironwood Marquette
Power Sault Ste. Marie

The subject material for the Upper Peninsula course will include the discussion of problems in internal medicine, general surgery, pediatrics, and obstetrics and gynecology, and will be presented by four clinicians specializing in these fields. On account of the exigencies of the War, personnel cannot be designated at this time, but the detailed program will be mailed later to all physicians in the Upper Peninsula. (See page 320 for other courses.)

The Value of Rest in Bronchial Asthma*

By Barney A. Credille, M.D.
Flint, Michigan

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■ THE general condition of the asthmatic should receive careful attention. It may be a time worn phrase, but it is an important one in this instance to treat the patient as well as his asthma.

Seemingly unimportant non-allergic factors may be overlooked in the study and investigation of the allergic patient in our zeal to reveal some unusual specific etiological allergen. These same offenders may later prove to be a handicap to the patient's recovery.

Vaughan[3] tells us that there is some evidence that, given a vagotonic individual, these so-called non-allergic or non-specific factors may provoke reactions in the absence of any allergens at all. He states that fatigue, emotional stress, and a number of undermining factors may so disturb a physiological adjustment that the patient will be susceptible to doses of allergens which otherwise would be without effect. It is interesting to observe the number of asthmatic patients who place so much emphasis on such non-specific factors, especially fatigue. For this reason, in the past two years I have been convinced that therapeutic effectiveness will be much greater if we stress the importance not only of fatigue, but all possible non-allergic factors. With fatigue playing such a rôle, it is interesting to observe that Sherwood[2] claims that fatigue lowers body resistance. Under such conditions it would be impossible to stimulate immunity if the patient does not have the resistance necessary for its production.

Rest is the most effective measure for functional fatigue. There is a wide range in the requirements of rest in both health and disease. The question again comes up of individual treatment. It has been my observation that the

*Read before the Midwestern Forum on Allergy, January 13, 1941, in Indianapolis, Indiana.

asthmatic requires more rest than is generally accorded him. Reference here is not made especially to those patients having acute attacks because it is obvious that in many cases bed rest is already self-imposed. While the handling of the acute attack is urgent and important, what we are especially interested in is the prevention of subsequent attacks. Bed rest is not necessarily essential in all asthmatics, but more rest would surely do no harm.

Indications for Bed Rest

Bed rest should be utilized for certain types of patients with asthma. It is indicated in all of those who are weak and feeble and complain of marked fatigue. It should be used for those who have associated other allergic conditions, especially migraine, hay fever, and urticaria and also those with complications of emphysema, sinusitis, and cardiac involvement. Prolonged bed rest is indicated in those patients who have failed to secure relief from usual allergic therapy.

What does bed rest do for the patient?

1. Bed rest restores quiet and relaxation.
2. Diet restrictions can be more easily regulated when patient is in bed. Preferably in hospital.
3. Rest enables patient to increase and maintain weight.
4. Bed rest often insures mental rest as well as body rest.
5. Rest in bed tends to minimize contact with certain offending allergens that otherwise would be a source of trouble.

Three or four months of bed rest are often adequate. If there is not a favorable response after at least two months of rest, chances are that bed rest will not influence the asthma and also offers the probability of other attending conditions and complications.

Case Report

My attention was first drawn to the possibilities of rest in a woman forty-six years of age with a resistant asthma. She had sustained a fracture of the pelvis and was confined to bed for two and one-half months. This rest period with supportive treatment seemed to stabilize her and with a continuation of allergic therapy, all of which conferred relief which she had not had in years. Her attacks gradually became less and at the end of her confinement to bed she was free of asthma and had gained eight pounds in weight. This experience stimulated more extensive application of rest to other types of allergic patients as well as a small, but interesting, group of asthmatics. Observations were made on fifteen patients with asthma who had not responded satisfactorily to conventional anti-asthmatic therapy. Ten of these cases were proved to be allergic. Three were bacterial type, and two non-allergic. Most of these patients received rest in bed both in the hospital and at home. Anti-asthmatic measurs were continued during bed rest period. The minimum period of rest was two months. The maximum period was three and one-half months. There was a definite improvement in nine of these patients. The other six cases, while showing general improvement of health and being much less dyspneic in bed, continued to have recurrences after being up and about. Three of the six patients had a rather marked emphysema and one of this group a bronchiectasis. Those nine patients showing a distinct improvement were kept under observation from three to sixteen months. Their improvement was manifested in freedom of attacks from two to six months. In five there was a gain in weight from seven to thirteen pounds. This was evidently due to the freedom of asthma, more sleep, and relaxation, and a nutritious diet. It is possible, too, that part of the relief was brought about by more complete control of diet while under observation in bed, both in the hospital and at home. The best results were observed in those cases in whom allergy could be demonstrated and these began to clear up earlier.

The ambulatory asthmatic experiences, besides the dyspnea from asthma and exertion, too much expenditure of energy from various kinds of activities. Pottenger[1] states that a person even sitting in a chair raises the energy requirements of the body twenty per cent over that required when lying flat on a couch. With a normal individual expending such energy one can readily imagine the enormous strain and energy requirements in the asthmatic. Naturally the needless exertion handicaps the already burdened patient. The writer feels that all asthmatics who have not responded to the usual therapy should receive, in addition to their treatments, adequate rest in bed because a great many of such patients are incapacitated anyway, and their contributions to society in their present status are but little.

This paper would not be complete if something was not mentioned about more emphasis being placed on the need of rest immediately following desensitization treatments. This does not mean that they should necessarily go to bed, but over-exertion and over-activity should be curtailed. The writer has seen some systematic reactions which were thought to be greatly influenced by over-exertion following injections of antigens.

In closing, it might be added that I am in accord with Vaughan[3] when he stated that in asthma, as in nearly all of the clinical allergic manifestations, experience shows that treatment based on concepts other than those of allergy often give material relief. He further states, assuming that allergic therapy has been more successful than any of the other procedures, "One must yet realize that there is a sufficiently high

proportion who are not yet relieved, and that a combination of allergic therapy with non-allergic methods will sometimes accomplish the desired results."

Summary

In the investigation and treatment of the asthmatic more emphasis should be placed on the importance of the non-allergic factors such as fatigue, emotional upset, et cetera.

The ambulatory asthmatic patient experiences a tremendous expenditure of energy, not only from the dyspnea but from the usual daily activities. Therefore they require more rest, especially the chronic type.

From the study of this series of fifteen cases, while representing a rather limited number of patients, the results have been significant and it is felt that all resistant cases of bronchial asthma should be given benefit of prolonged rest in bed in conjunction with other therapy.

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MSMS

DEMAND AND SUPPLY OF PHYSICIANS

The medical schools have produced an adequate supply of graduates in medicine. At one time these men all entered private practice. To do otherwise was likely to be regarded as irregular or unethical; but evolution comes out of changes and today the medical graduate has a choice of specialized fields in which he can engage ethically, profitably, and with professional as well as personal satisfactions. Preparation for these special fields is not necessarily confined to medical postgraduate schools. In some of these one must "learn by doing" under the guidance of pioneers who have established and developed the early special services—in industrial health, in public health administration and supervision, in hospital and sanatorium administration, in medical society administration, in school health supervision, in investigating and approving grants given to qualify men for specific health needs by Foundations which employ medically trained men.

Health is now a large and complex concept, and has many specialized fields of its own. To the younger medical graduates of today there are increasing opportunities for men of vision, initiative, and energy who will recognize and accept these new opportunities and fit themselves to succeed in these new fields rather than to join the already over-crowded field of general medical practice. Service must be adapted to human and social needs as they arise.—L. A. W., *Journal of the Medical Society of New Jersey,* Dec., 1941.

Relationship of the Reticulo-Endothelial System to Cellular and Humoral Immunity

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■ Much emphasis is being placed at the present time upon individual health and physical fitness in terms of the national emergency incident to a continuing series of international political crises. The physicians' rôle under such circumstances of universal mobilization of effort, is to see that every known fact essential to preserving and strengthening human resistance to disease is put promptly to work. Universal dissemination and application of such knowledge, desirable enough in peacetime, becomes as urgent a necessity in time of emergency as is food production and distribution, or munitions manufacture and transportation. War is invariably followed by famine, and famine by pestilence, and natural resistance, upon which each individual depends for survival, is modified greatly under these altered environmental conditions. The importance of "adequate" instead of minimal nutrition in this nation today is just beginning to be appreciated, and experimental evidence is accruing to show the *sine qua non* of certain essential food elements to effective cellular and humoral immunity in both virus and bacterial infections.[9] There are also other factors of known significance which I wish to emphasize here.

It is only since about the turn of this century,

*Address delivered before General Session, Michigan State Medical Society, September 19, 1941. Illustrated with lantern slides and kodachrome microcinematography.

and more particularly since 1913, when Aschoff and Kiyono[1] crystallized and popularized the reticulo-endothelial concept of tissue cell (macrophage) phagocytosis, that the cellular contribution to resistance really assumed significance in our thinking. This hypothesis furnished an important corollary and supplement to Metchnikoff's studies[19] of the rôle of "microphage" or neutrophilic granulocyte in acute inflammatory reactions. Today it is believed that the reticulo-endothelial system represents a functional unit comprised of mesenchymal derivatives possessing the common property, highly developed, of specific cellular phagocytosis. In this discussion it would hardly seem appropriate or pertinent to survey the various theories and hypotheses which have developed around the exact origins and morphologic relationships of the cells contributing to and participating in this system. Our interests here are chiefly functional, about which there remains little controversy, and reference may be made to other readily available sources[5,6,15] for the details of cell classification.

The evidence is fairly conclusive that physiologically the macrophage engulfs old, or senile, or injured red blood cells, white blood cells and probably thrombocytes, and, after intravacuolar "digestion," conserves important basic constituents, such as iron, for resynthesis. The segregation and disposition by ingestion of bacteria, and the phagocytosis of identifiable particulate débris, such as anthracite or silica in the lung, may be demonstrated any time by any clinical pathologist. The experimental cytologists have repeatedly shown the predilection of Kupffer cells of liver and macrophages of spleen, bone marrow, lymph nodes, omentum, and diffuse connective tissues for the intracellular isolation and concentration of pyrrhol or trypan blue, carmine or carbon. Thus, these phagocytic scavengers of the mammalian tissues are basically protective and conservational in the normal body economy.

However, these very essential functions, if and when over-accentuated, may result in one or other of, or in a combination of, characteristic pathologic and clinical syndromes. The spleen is the site of the greatest single localized concentration of macrophages in the human individual, and it is the organ of greatest physiologic sequestration and reservoir reserve for all circulating blood elements. It is an organ which hypertrophies under many conditions with a parallel increase in parenchymal sequestration capacity, and with, frequently, a corresponding hyperplasia of macrophages. If combined with these potential facilities for rapid segregation and destruction, there should exist or develop some peripheral or central bone marrow interference with the usual integrity of any given group of circulating cells, the stage would be perfectly set for a more or less rapid pathologic depletion of essential elements. This is exactly what happens in fact, repeatedly, and, whenever such a mechanism is recognized, the successful removal of all splenic tissue is followed by complete cellular reëquilibration and permanent clinical cure.

Congenital Hemolytic Icterus

Physiologic erythrophagocytosis is followed promptly (within not more than two hours probably)[10] by red cell disintegration and the splitting of the hemoglobin molecule into globin and hematin. The latter is then broken down into: (1) the iron-free pigment hematoidin, which becomes the bilirubin of the plasma in hemolytic jaundice, or is secreted by the hepatic parenchymal cells as bile; and (2) hemosiderin, in which form iron remains stored until needed for hemoglobin resynthesis in the bone marrow. Mann and his associates[18] have demonstrated conclusively that the macrophages of spleen and to some extent bone marrow, not the stellate cells of the liver, are normally the principal sources of bilirubin, and Kanner[16] has reported, and I can confirm, that no histologic alteration in the Kupffer cells of the liver occurs in hematogenous icterus. Upon these observations may be based the modern approach to the pathologic physiology of human congenital hemolytic icterus. A dominantly inherited constitutional tendency to excessive hemolysis, upon which many environmental factors (pregnancy, trauma, minor infections) may play disastrously, has been clearly established.[7,8] The more active phases of this disease are invariably associated with a directly proportionate degree of splenomegaly, in which excessive parenchymal erythrocyte segregation and phagocytosis may readily be demonstrated. Moreover, splenectomy, when successfully accomplished, and if it includes the removal of all accessory splenic tissue — even though the operation be performed during an acute hemoclastic crisis[7] — invariably results in an immediate, complete, and usually permanent remission. Any significance, other

than diagnostic, of defective, spherocytic erythrocytogenesis in congenital hemolytic icterus remains an open question. Haden[13] believes spherocytosis to be the congenital prerequisite to inclinical syndrome is dependent upon an underlying and more essential splenic dysfunction. Too, patients in the series subjected to frequent exacerbations of hemolysis and anemia secondary to

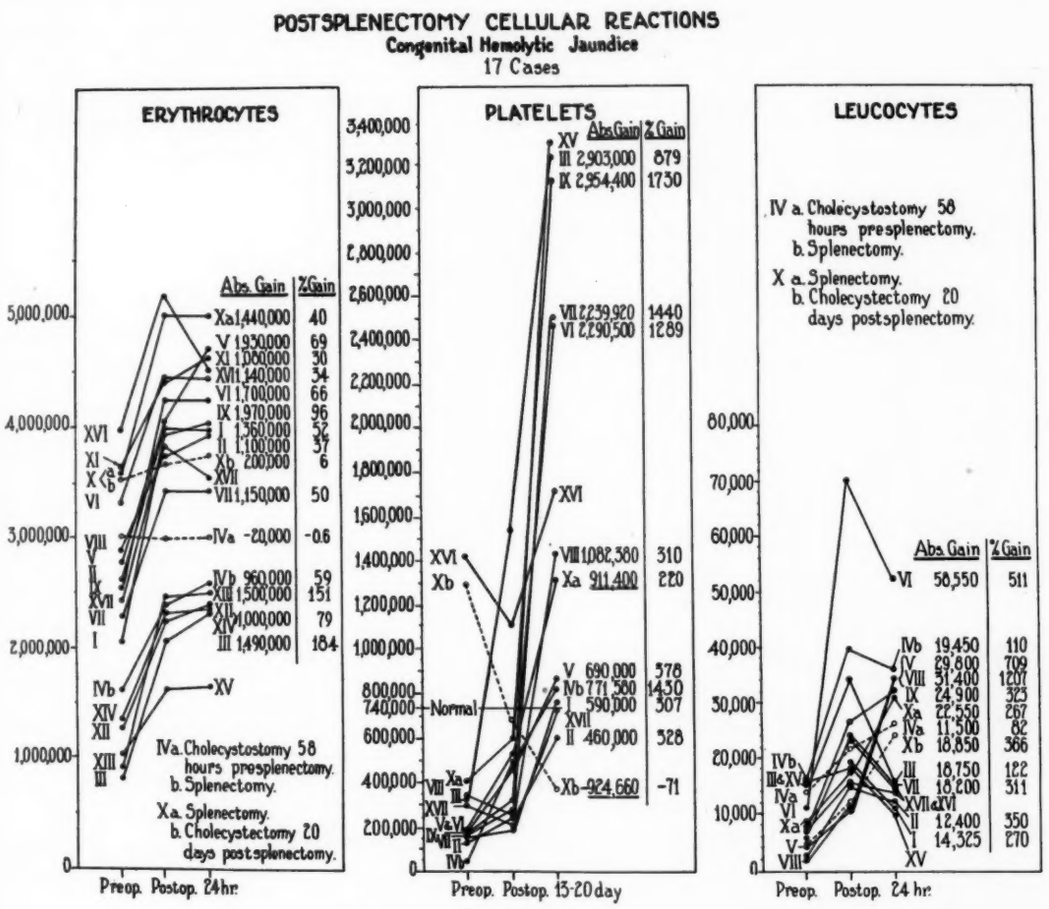

CHART I.

creased erythrocyte fragility, while Dameshek[3,22] interprets spherocytosis as the end result of hemolysin activity upon mature red blood cells without any inherent marrow defect.

More frequently than not in the fairly large series of families with congenital hemolytic jaundice here studied, a concomitant leukopenia and moderate thrombocytopenia have been encountered. This could, perhaps, be attributed to a myelophthisic displacement of myelocytes and megakaryocytes by the excessive, compensatory, erythroid hyperplasia always found in the marrow during hemolytic activity. The fact, however, that splenectomy is invariably followed *immediately,* not only by a marked and substantial increase in the red cells, but also by a hyperleukocytosis and thrombocytosis (Chart I)[7] at least strongly suggests that any marrow contribution to this minor infections and traumata — occasionally to the point of chronic invalidism — have been rendered completely free of such episodes following splenectomy. Lord Dawson of Penn, whose interest in this particular disease caused him to follow over a period of some forty years members of affected families in Britain both with and without splenectomy, particularly emphasized this restoration to physical normalcy following surgery, citing a number of splenectomized patients who successfully endured and survived the difficulties and hardships of severe trench warfare during World War I.[4]

Furthermore, long continued chronic hemolysis, with occasional subacute exacerbations, eventually results in cholelithiasis in some 60 to 70 per cent of such individuals, with

gall-bladder colic leading to gall-bladder surgery in a not inconsiderable proportion.[7] Prophylactic splenectomy, even in the absence of acute crises or profound anemia and jaundice, is, therefore, indicated when the diagnosis has been clearly established. The trait, once inherited, subjects its victim to the potential danger of an acute hemoclastic crisis in any decade of life, susceptible of precipitation by any one of a number of uncontrollable environmental factors.

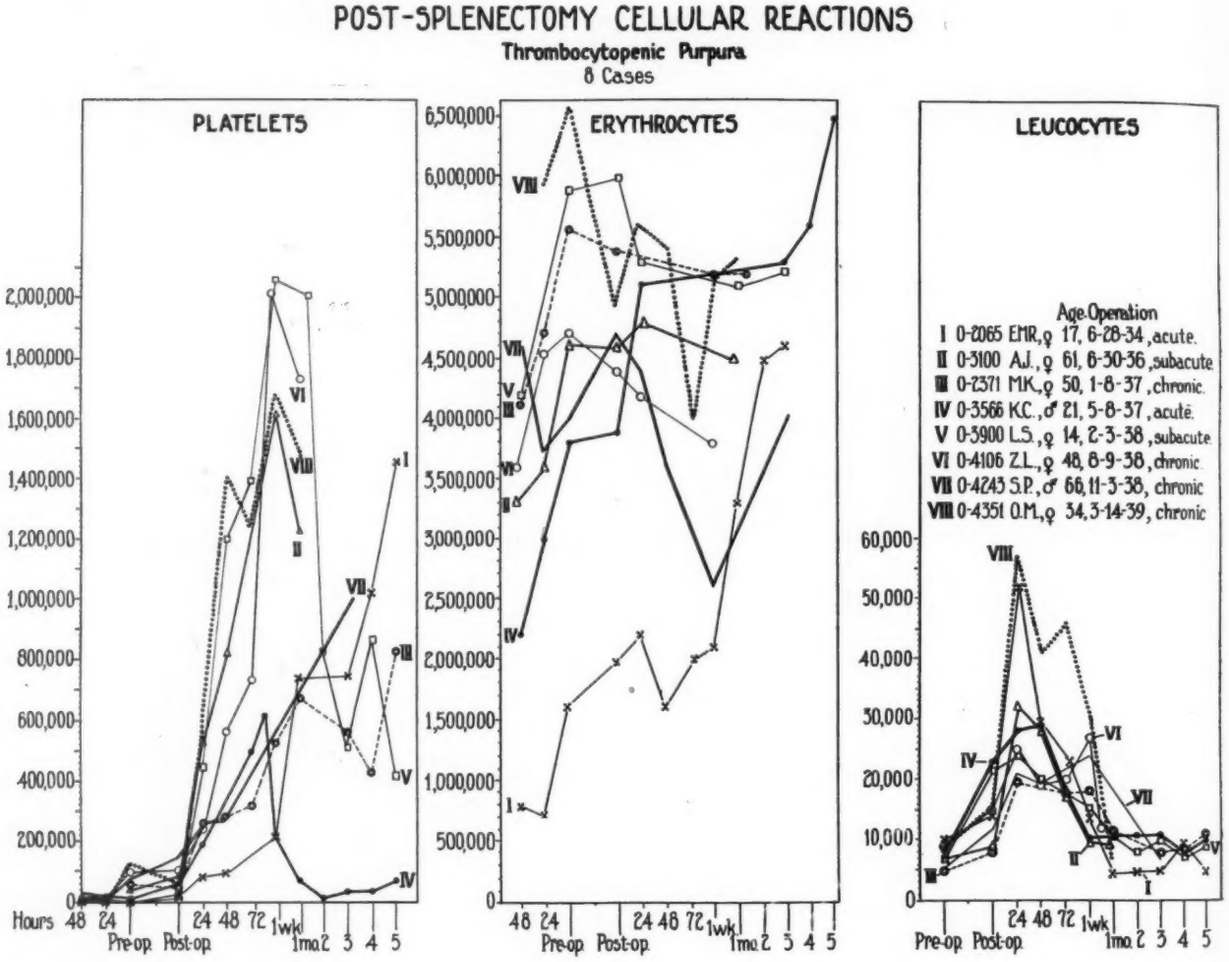
POST-SPLENECTOMY CELLULAR REACTIONS
Thrombocytopenic Purpura
8 Cases
PLATELETS
ERYTHROCYTES
LEUCOCYTES
Age.Operation
I 0-2065 EMR.,♀ 17, 6-28-34, acute.
II 0-3100 A.J.,♀ 61, 6-30-36, subacute.
III 0-2371 M.K.,♀ 50, 1-8-37, chronic.
IV 0-3566 K.C.,♂ 21, 5-8-37, acute.
V 0-3900 L.S.,♀ 14, 2-3-38, subacute.
VI 0-4106 Z.L.,♀ 48, 8-9-38, chronic.
VII 0-4243 S.P.,♂ 66, 11-3-38, chronic.
VIII 0-4351 O.M.,♀ 34, 3-14-39, chronic.
Hours 48 24 Pre-op 24 48 72 1wk 1mo 2 3 4 5
Post-op

CHART II.

Farrar, Burnett, and Steigman[11] report a patient with hemolysinic anemia with hepatic degeneration who responded dramatically to emergency splenectomy although excessive erythrophagocytosis by splenic macrophages was not apparent. A hemolysin was demonstrated in the blood serum before, but not after, removal of the spleen. Thus, at least two possible mechanisms of red blood cell destruction must be attributed to the spleen in hemolytic states; the one, direct phagocytosis by reticulo-endothelial cells, the other, indirect hemolysin elaboration, probably by the same cells.

The integrity and sufficiency of the marrow in this disease has been found unimpaired for any and every demand, physiologic as well as pathologic, when splenic tissue has been eliminated. The widespread impression that individuals may not long survive, or that they are incapable of ordinary physical effort in the absence of the spleen, is entirely unfounded. That they may not survive if a functionally pathologic spleen is permitted to remain in situ is a fact.

Essential Thrombocytopenic Purpura

Among the many purpuric syndromes is one which may be designated descriptively as essential thrombocytopenic purpura. Occasionally chronically, but usually more or less suddenly, an

abnormal bleeding tendency develops, without any apparent cause, in the absence of preceding or concomitant infection or endocrine disturbance, and with a negative history for allergy, exposure

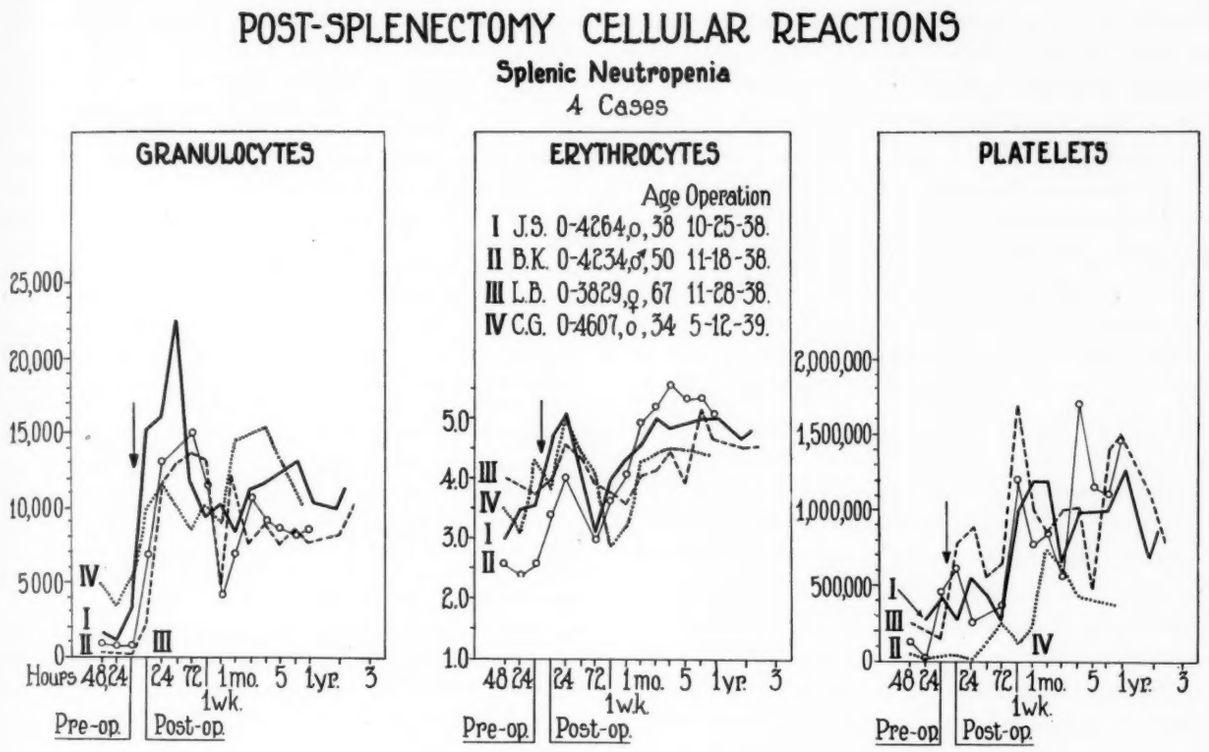

CHART III.

to industrial chemicals, or sedormid or other drug medication. Plasma prothrombin is 100% and serum vitamin C within physiologic limits. The blood platelets are found to be markedly diminished, the bleeding time is prolonged, and, while a clot forms, it does not retract after many hours. The red blood cells and reticulocytes are normal unless there has been excessive hemorrhage—uterine, gastro-intestinal, epistaxes. The white blood cells are likewise unaffected except when leukocytosis follows acute blood loss. The sternal bone marrow is cytologically normal, with perhaps some increase in the proportion of young, otherwise qualitatively normal, megakaryocytes. There are no abnormal physical findings other than the purpura; no adenopathy; *no splenomegaly*. An adrenalin test may or may not produce a transitory increase in circulating platelets. Such evidence points to the thrombocytopenia as the principal cause of the hemorrhagic diathesis. It tends to exonerate the bone marrow in terms of apparent megakaryocytic adequacy, and suggests some peripheral factor or factors: (1) excessive selective, pathologic phagocytosis and destruction of circulating platelets by the macrophage group of scavenger cells;[17] (2) humoral inhibition of normal platelet delivery from the marrow;[12] or (3) thrombocytolysis by "thrombocytopen."[23] To the spleen has been attributed all three of these possible mechanisms, and rightly so, if the prompt return of platelets to the circulation with disappearance of purpura following successful splenectomy are dependable criteria (Chart II). A pre-operative, fresh whole blood transfusion will render surgery safe in these cases. The megakaryocytes in the bone marrow observed, both before and after splenectomy, showed no qualitative or quantative changes upon which to base an explanation for the very prompt reversal of platelet concentration in the circulation.[25] The reticulo-endothelial phagocytes in the spleen, therefore, probably play an important part, either directly or indirectly, in this syndrome of essential thrombocytopenic purpura.

Primary Splenic Granulocytopenia

It only remained to discover a granulocytopenic syndrome, analogous to congenital hemolytic icterus and essential thrombocytopenic purpura, to complete the trilogy of diseases theo-

retically dependent upon altered, physiologic, splenic, R-E system functions. In May, 1939,[24] four cases with profound granulocytopenia believed to represent such an entity were reported from this clinic. Splenomegaly was a prominent finding in the acute, subacute and chronic forms of this malady, the bone marrows invariably showed myeloid hyperplasia, and splenectomy resulted in complete recovery in every instance (Chart III). Moreover, supravital studies of scrapings from the splenic parenchyma made immediately after its removal showed many granulocytes, and from 5 to 10 large, highly phagocytic macrophages in every oil immersion field of the microscope, with the majority of intact engulfed cells being granulocytes. In some patients there were associated secondary depressions of platelets and/or red cells, and the adrenalin test resulted in a temporary increase in all of the circulating elements. Every functional test for liver integrity has been negative, liver and gall bladder have been grossly normal in appearance at the operating table, and biopsies of liver tissue have confirmed the absence of any pathologic alterations in this organ. These latter findings separate quite sharply this entity from the so-called Banti's syndrome, in which cirrhotic portal hypertension[20] and terminal ascites are uniformly emphasized essentials.

Mixed Splenic R-E System Syndromes

If three sharply defined hemolytic, thrombocytolytic, and granulopenic syndromes, respectively, have been recognized, and each has been proved to be related primarily to splenic dysfunction, both by appropriate laboratory tests and by the therapeutic test of splenectomy, it would be strange indeed biologically if certain overlapping syndromes did not appear from time to time. This should be particularly true if the suspected mechanism in these three instances is based upon R-E system hyperplasia and increased selective phagocytosis. Every combination of partial or extreme peripheral depletion of the circulating elements deriving from the bone marrow, but without marrow hypoplasia, has been encountered clinically in our patients, when studied from the standpoint of critical analysis of mechanism in each individual rather than by previous classical diagnostic generalization.

One example may perhaps suffice to illustrate this point. A twelve-year-old white girl was admitted to the Research Service, University Hospital, May 6, 1941, with the chief complaints of anorexia, weakness, persistent low grade fever, frequent epistaxes, bleeding gums, and generalized ecchymoses and petechiæ of skin and mucous membranes. The patient had been in usual health until February 5, 1941, when she became ill with what was diagnosed as "influenza and bronchitis with sore throat and enlarged cervical lymph glands." One week after the initial onset, small subcutaneous ecchymoses appeared first on the arms and subsequently in "crops" over the entire body, which phenomenon continued up to and including the time of admission. Some 20 epistaxes were reported, the last having continued for twenty-four hours just prior to entering the hospital. A "diarrhea" of four to five "tarry" stools daily had persisted for two weeks, with a weight loss from 74 to 71 pounds. The patient is said by the mother never to have been physically strong or rugged, having suffered more or less severely from all childhood diseases, and having always "bruised easily." Family history was noncontributory for blood dyscrasias, etc. The significant physical findings on admission were: temperature 100°F., pulse 88, respirations 24, blood pressure systolic 114, diastolic 60; pallor of skin and mucous membranes with numerous petechial hemorrhages scattered over chest, abdomen, back and extremities, and large ecchymotic areas over right arm and shoulder and in right and left antecubital fossæ; the gums were red, retracted, and oozing blood at several points; tonsils hypertrophic but not grossly infected, with moderately enlarged, discrete, nontender cervical nodes bilaterally, and in the left axilla; *the spleen was readily palpable on deep inspiration at the left costal margin* without hepatomegaly. Laboratory data: total white blood cells 3400-5100; total red blood cells 3,060,000 to 3,250,000; hematocrit 33 per cent; hemoglobin 11 gms./100 c.c.; reticulocytes 6.8 per cent to 9.2 per cent; *blood platelets 6400 to 32,000 per cu. mm.* (normal 700,000); corrected erythrocyte sedimentation rate 0.3 mm./min. (normal); erythrocyte fragility range .412-.300; icterus index 5; prothrombin 60 per cent; representative supravital differential, white blood cells, neutrophils 56 per cent, eosinophils 4 per cent, lymphocytes 34 per cent, monocytes 6 per cent without significant qualitative abnormalities; bleeding time 6½ minutes, Howell's coagulation time 10 minutes with delayed clot retraction; hippuric acid 3.7; urinalysis essentially physiologic; serology negative. The *sternal bone marrow* on May 8 was grossly hyperplastic with red rather than gray tissue flecks; microscopically by actual count the RBC:WBC ratio was 5:1; normoblasts predominated with frequent mitotic figures observed in the few erythroblasts and occasional megaloblasts present; the myeloid elements were largely neutrophilic and at the myelocyte C or relatively mature stage with a few eosinophils; the megakaryocytes appeared to be increased both relatively and in absolute number (as many as three being found in one oil immersion field) and were seen in every stage of maturity from young, large mononuclear megakaryocytoblasts through intermediate to large, typical, mature granular magakaryocytes; only one plasma cell, an extremely rare phagocy-

tic macrophage, and no monocytes or other cells foreign to normal bone marrow were encountered. *Interpretation,* generalized pan-marrow hyperplasia of all normal cell types, with a significant left shift only in megakaryocytes, without evidence of toxic destruction or maturational arrest, therefore, a reflection of excessive peripheral demands for *all* types of circulating elements. The *adrenalin test* on May 9 showed a maximum rise in total white blood cells from the base line of 3450 to 7100 at the end of 15 and 50 minutes; red blood cells from 3,250,000 to 4,100,000 at the end of 50 min., and hemoglobin 11 gms. to 12 gms.; the platelets fluctuated between 32,500 and 14,000, the lower figures being recorded during the test.

Both the granulopenic leukopenia and splenomegaly, proven by direct and indirect evidence, are incompatible with a simple diagnosis of essential thrombocytopenic purpura. In no other instance of uncomplicated splenic purpura in our experience to date has the spleen been clinically palpable or at operation been found to be enlarged. The evidence seemed to justify the preoperative diagnosis of thrombocytopenic purpura *and* granulocytopenic leukopenia, both attributable to splenic hypersequestration with compensatory marrow hyperplasia including the red cells secondary to purpuric hemorrhages.

Following parenteral vitamin K and a blood transfusion of 200 c.c. to control hemostasis, splenectomy was accordingly successfully accomplished on May 13. The temperature rose no higher postoperatively than the pre-operative base line of between 100 and 101°F, and became normal for the first time in four months on the fifth postoperative day. On the day of operation the total white cells rose from 3900 with 74 per cent neutrophils at 9:00 a.m. to 44,400 with 96 per cent neutrophils by 3:45 p.m., the spleen having been removed about 11:00 a.m.; the red blood cells increased from 4,090,000 to 5,200,000; and the blood platelets from 16,400 to 165,580. The following day the platelets were 509,000 per cu. mm. and by the seventh postoperative day had risen to 2,616,000 per cu. mm. Under adrenalin stimulation after exposure, the spleen contracted to approximately one-third of its gross size as first observed before the pedicle was clamped, and when removed, measured 4½x3½x2¼ inches and weighed 205 grams. Immediate supravital studies of the splenic parenchyma revealed a most striking abnormal segregation of polymorphonuclear neutrophils, an occasional myelocyte C and eosinophilic granulocyte, and from 1 to 3 very large, highly phagocytic macrophages per oil immersion field containing many myeloid elements, fewer red blood cells, and much smaller material which could be interpreted as platelet débris. There were the usual number of qualitatively normal lymphocytes; no increased fibrosis and no other pathologic cells or tissue changes were apparent. The patient was discharged on the fourteenth postoperative day in normal hematopoietic and clinical equilibrium and when last seen, June 18, 1941, she had 13,600 white blood cells, 4,270,000 red blood cells, hematocrit 41 per cent, 13 gms. of hemoglobin, 832,000 blood platelets, 65 per cent neutrophils, 7 per cent eosinophils, 21 per cent lymphocytes, 7 per cent monocytes.

Other instances superficially typical, in so far as the peripheral blood deficiencies were concerned, of aplastic anemia have been studied similarly and the bone marrow found to be hyperplastic, with splenectomy specifically remedial of signs and symptoms. Blood transfusions have only limited usefulness in such cases and an increasingly careful diagnostic analysis I believe will result in the recognition of increasing numbers of such patients for whom complete clinical arrestment may be provided.

The R-E System and Humoral Immunity

In addition to the observations of selective phagocytic activity on the part of the reticulo-endothelial cells, a great many investigations have been undertaken in the attempt to demonstrate a direct relationship between this cellular system and humoral immunity. Reticulo-endothelial cell blockade with carbon particles or various vital dyes, or extirpation of the spleen, or both, have preceded the administration of a variety of antigens, with the variation in antibody titers, subsequently developed, used to measure the specific sensitivity of the tissue response. Most of the evidence thus accumulated has seemed to indicate the existence of an intimate relationship between the integrity of the reticulo-endothelial system and antibody formation.

For example, when foreign erythrocytes are injected into an animal for the first time they are promptly removed and destroyed by the macrophages of the R-E system; when red blood cells from the same source are again injected after a suitable interval, intravascular, extracellular hemolysis occurs through the action of circulating hemolysins. That the cellular elements originally responsible for the elimination of the foreign red blood cells by phagocytosis should be the most likely source of the newly developed hemolysins is a reasonable assumption. In support of this hypothesis is the almost complete agreement that hemolysin production is interfered with to a greater or less degree by reticulo-endothelial blockade.[2]

Most convincing, however, have been the more

recent experimental studies utilizing the synthetic chemists' ability to unite certain dyes with proteins to form "marked antigens" capable of being traced visually when introduced into the animal body or into tissue cultures. Sabin[21] took the alum precipitate of Heidelberger's R-salt-azo-benzidine-azo-egg albumen, whose readily visible purplish-red particles had been proved to be of superior antigenic potency,[14] and followed its physical disposition via various avenues of injection in rabbits. The antigen was observed to be quickly phagocytized by typical cells of the R-E system and to slowly undergo changes characteristic of molecular disintegration within vacuoles of segregation. During the third to seventh days increasing vacuolization of the peripheral cytoplasmic zone of the enlarging macrophages was noted with progressive fragmentation and lysis of bits of cytoplasm coincident with the beginning demonstration of specific circulating antibodies. These cellular studies were made with supravital preparations of excised tissues, chiefly the omentum after intraperitoneal injections of the dye antigen.

It seemed desirable to augment these studies of Sabin by the inoculation of tissue cultures of macrophages with the same antigen, there to study and record cinematographically in color from hour to hour and from day to day the fate of this "marked protein," and to attempt to correlate even more certainly the appearance of specific anti-bodies with the observed cytologic phenomena. For the past two years Dr. Ben C. Houghton has been making such observations in this laboratory, employing explanted bits of rabbit spleen as the original source for tissue macrophages, and using the same azo dye antigen generously furnished by Dr. Michael Heidelberger from his laboratory at the College of Physicians and Surgeons, New York City. Data and information obtainable in no other way and through no other medium have now become available to fill in the vital gaps in our chain of evidence linking the R-E phagocytes with specific globulin antibody formation. The details of Sabin's original observations and of this supplemental cinematographic record make fascinating reading and study, but it is possible here to give only the summary of the interpretations which would seem to be wholly justified on the basis of the accumulated evidence: the phagocytic endothelium, both vascular and lymphatic, as well as the free macrophages of the tissues everywhere, are constantly phagocytizing foreign materials which may be divided into two general groups, antigens and nonantigens. These substances are first segregated into the vacuolar organs of digestion of the cell and prepared for diffusion into the cytoplasmic zone of synthesis; the normal food substances ingested are utilized in the formation of normal globulin, but foreign antigenic proteins increase and modify this synthesis of globulin, so that with the shedding of parts of the surface films of such cells, both normal and antibody globulins are carried into the blood plasma. This conforms with the observation of a concomitant increase in both under such circumstances. These cells, during the period in which the modified globulin remains within the cytoplasm, react differently from the normal cell in the presence of additional original antigen, thus relating "sensitization" and "immunization" to different phases of the same mechanism.

The variation in species and individual response to various antigenic substances is readily explained by Sabin's observations. Two distinct steps are necessary for the development of antibodies; first, the phagocytosis and intravacuolar preparation of the antigen for introduction into the cytoplasm proper; and, second, the synthesis of new and modified globulins. Both these phases require time, which would naturally vary with the quantity of antigen available, its relative ease of degradation, and its ability to modify normal globulin synthesis. Furthermore, the units which comprise this phagocytic defense system of the mammalian organism are as diversified in origin and definitive type, and probably, therefore, in functional specificity and efficiency, as are the several units of a modern army-granulocytes, monocytes, clasmatocytes, endothelial phagocytes, specialized as in the Kupffer cell and nonspecialized as in the lining cells of the lymph sinuses; and it is probable that each responds differently, quantitatively if not qualitatively, to different antigens and under different environmental circumstances. The various chemotherapeutic agents either assist or prevent clinical recovery in infectious diseases to the extent that they aid or hinder this important cellular mechanism of the body in its

phagocytic and antibody-forming functions plus any direct effect they may have on limiting the multiplication of pathogenic bacteria.

These recent studies mark an enormous advance in our understanding of the essential mechanism of natural and acquired immunity, yet represent but a logical consummation and final unique demonstration of an hypothesis supported by the gradually accumulated experience of many years.

Summary

The reticulo-endothelial system of highly phagocytic cells performs certain vital physiologic protective and conservational functions including phagocytosis of senile or damaged red blood cells, bacteria and foreign bodies. Under certain hereditary and environmental circumstances the phagocytic activity of these cells may become accentuated to a pathologic degree resulting in several disease syndromes frequently mis-diagnosed as dependent upon a primary bone marrow rather than a splenic mechanism. Such instances, when properly recognized, may be permanently corrected by successful splenectomy. The probable physiologic contribution of the R-E cells to normal globulin formation may be altered by the ingestion of "foreign" antigenic proteins with the elaboration of specific globulin antibodies.

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MSMS

Some Uses of Chemotherapy in Ophthalmology*

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■ BECAUSE of the rapid development of chemotherapeutic agents one is apt to feel that they are a new approach to the problems of treating disease. But the treatment of infectious diseases by chemical compounds goes back many decades. Medicine has long looked and found some chemical compounds which are bactericidal or bacteriostatic in relatively high dilutions which are devoid of marked local irritative effects or general harmful reaction on the human body. The arsenic and bismuth compounds in the treatment of syphilis are a great achievement for medicine. Recent development of chemotherapeutic agents has been so rapid that it is difficult to keep accurately informed. As is usual, too many inade-

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quately tested compounds are offered to the practitioner under pressure of considerable recommendation. The physician knows, however, that a conservative and cautious attitude is essential in scientific medicine, especially relating to therapeutic agents.

Hematuria, anuria with azotemia and rarely agranulocytic angina have been reported with some of these drugs. Congestion of the sclera and conjunctiva have been reported following sulfathiazole. Other ocular and auditory disturbances are rare. Transitory myopia has been reported associated with the use of some of these drugs. When used intravenously, they should be given slowly with considerable salt solution. The state of the pharmacology of these compounds leaves much to be desired. The clinical reports are often most brilliant.

There are certain precautions necessary in the use of these compounds. Substantial fluid intake, or forced fluids, are usually indicated. Many find benefits in the increased use of milk, egg and chocolate drinks; others are relieved by the use of bicarbonate of soda, the same dosage as that of the chemical used. Few reactions occur from the use of sulfadiazine. Patients under sulfonamide treatment should not be allowed to roam around at will without supervision. They should not carry on their usual occupation, particularly if it pertains to driving a motor vehicle. Differential count and blood levels the first day and daily, or every two days thereafter, including hemoglobin estimation and urinalysis, are indicated.

Sulfanilamide, sulfapyridine, sulfathiazole and sulfadiazine have a demonstrated clinical value. These substances call for an expanding use by the ophthalmologist. It is important to remember that other established therapeutic agencies need not be discarded nor neglected with the use of the substances above. Also, some patients are hypersensitive to the compounds named above and require other forms of treatment.

The methods by which these substances work are not known clearly. Their point of attack is obscure. Information is accumulating, however, from experimental studies; and the trend now seems to be that these substances inhibit growth or multiplication, rather than being immediately lethal to the organisms. Some studies indicate that sulfathiazole is not held in sufficient concentration in the deep intraocular fluids to be very effective, whereas sulfanilamide and sulfapyridine may reach these areas in effective doses. Sulfathiazole, however, does concentrate effectively in the sclera, apparently, and also in the uveal tract in practical doses, as well as having a decided effect on some conjunctival diseases.

Inclusion Blennorrhea.—Treatment, oral; dosage, sulfathiazole ⅓ grain per pound daily in divided doses. This dosage is continued for three to four days and may be stopped after the fourth to seventh day. Local treatment consists of antiseptic washes and the use of 5.0 per cent sulfathiazole ointment.

Gonorrheal Ophthalmia or Gonorrheal Conjunctivitis.—Effectively treated with oral dosage of sulfapyridine, sulfadiazine, sulfathiazole or sulfanilamide; dosage, oral, 3 to 4 grams for an adult, subsequent dosage one gram every four hours; child, ⅓ grain daily per pound of body weight in divided doses. The initial doses may be larger than the subsequent doses to hasten the effect. Local treatment is in order, such as ice compresses, antiseptic irrigations and sulfrapyridine ointment 5.0 per cent several times a day, atropine if indicated, conjunctival flap if indicated due to ulceration and imminent perforation. The local use of the powdered drug has been used with success by some.

Staphylococcus Hemolytic Conjunctivitis.—Local treatment with 5.0 per cent sulfadiazine or sulfathiazole ointment form in connection with zephiran 1:2500 each four or five times a day have been very helpful in those cases failing to respond to staphylococcus toxoid.

Pneumococcus Conjunctivitis and Keratitis with Ulcer.—Sulfapyridine or sulfadiazole; initial dose 2 to 4 grams by mouth, followed by one gram every four hours around the clock; local application of 5.0 per cent ointment of either of the above; cautery and atropine and foreign protein, typhoid para-typhoid shocks, are of course of great value. The powdered pure sulfa drugs dusted on the cornea help in some cases. Paracentesis, delimiting keratectomy, are of value when indicated.

Uveitis.—Acute uveitis in some cases is helped by the oral administration of sulfa drugs. Their indiscriminate use is to be avoided, and of the four principal drugs sulfapyridine has proven most effective, sulfathiazole least effective, sulfadiazole about as effective as sulfapyridine.

Orbital Abscess.—Best treated with sulfapyridine, sulfadiazine, or sulfathiazole; initial dosage 2 to 4 grams, with one gram every four hours around the clock for adults, reduced proportionately for children. Other measures, of course, such as limited use of hot, moist dressings and drainage, must be considered.

Iritis.—In a moderate degree of iritis the method of hastening recovery by sulfathiazole or sulfadiazine is sometimes added; initial dose 3 grams followed by one gram around the clock every four hours.

Iridocyclitis and Choroiditis.—Similarly influenced by the medicaments used in the iritis above, but recurrence and return of symptoms follow incomplete dosage.

Blepharitis.—Blepharitis and that form of punctate keratitis associated with chronic conjunctivitis, especially staphylococcus; also sometimes cured by the use of sulfathiazole or sulfadiazine 5.0 per cent ointment.

Dendritic Keratitis.—The local use of the powdered form of the drug or the 5.0 per cent ointment has been of uneven value, also 0.5 per cent sulfanilamide irrigations have proved of doubtful value.

Trachoma.—Treated by sulfanilamide, oral dosage, 2 grams, and one gram every four hours in a period of a week to ten days; or sulfapyridine or sulfadiazine may be used. Mixed reports are coming in on the value of this treatment in trachoma. It seems definitely established that secondary infections are reduced, and in the hands of the majority marked improvement from the disease is noted.

The Special Ulcer of the Cornea Due to Pyocyaneus.—This condition should be treated (a matter of hours) with sulfapyridine or sulfadiazine; initial dose 4 grams, followed by 2 grams secondary dose in 2 hours and one gram every four hours thereafter around the clock, continued for a week or ten days.

Late Trephine Infection, Endophthalmitis.—This may be arrested and the process stopped by the use of sulfapyridine or sulfadiazine; initial oral dose, 4 to 6 grams, followed by 2 grams the second hour, one gram every four hours around the clock. A cyclitic cataract may develop in such a profound inflammation and toxic state, and the lens in turn may require removal if any increase in tension develops and other treatments fail.

Postoperative Infection following Intraocular Surgery.—Postoperative infection is usually manifest by the third day. In addition to foreign proteins the sulfonamide drugs are valuable; initial dose, sulfapyridine or sulfadiazine 4 to 6 grams, followed in two hours by one gram and every four hours a gram dosage around the clock.

MSMS

Chemotherapy in Infectious Diseases*

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■ THERE is no denying the fact that the treatment of infectious diseases has been revolutionized during the last six years. This has been due in large part to the introduction of the various sulfonamides. I propose to discuss the present status of chemotherapy in the treatment of five

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groups of infections, namely meningitis, pneumonia, wound infections, urinary-tract infections, and gastro-intestinal infections. The relative merits of the various sulfonamides and the toxicity of the various compounds will be briefly covered.

Bacterial Meningitis

The treatment of bacterial meningitis has been completely changed during the last few years. Some types of the disease which were invariably fatal before the days of sulfonamide therapy may now be treated with reasonable success. It is well to discuss each type of meningitis separately, since the treatment varies somewhat with the type of bacteria concerned.

Meningococcol Meningitis

Except for tubercular meningitis, this is the commonest type of bacterial meningitis. It occurs in both epidemic and sporadic forms, and is most often observed under the age of five and in adults who work and live under conditions of close contact. Miners and soldiers are commonly exposed, and epidemics among such groups are common. The infection is spread from the nasopharynx by carriers, or by those with the disease. Frequently, the infection is preceded by a head cold. The meninges are infected either by direct extension along the perineural sheaths of the olfactory nerve or by the hematogenous route. The blood cultures are commonly positive early in the course of the disease, especially in young individuals.

The treatment of choice is chemotherapy, and all the published reports indicate that sulfanilamide, sulfapyridine, sulfathiazole, and sulfadiazine are all effective. These compounds are usually given by mouth, but the sodium salts of the last three have been used intravenously in some cases, with excellent results.

It is not necessary to give any of these drugs intrathecally in the treatment of meningococcal infections.

Summary of Treatment of Meningococcal Meningitis

1. Blood should be obtained for culture.
2. Lumbar puncture should be done to establish the diagnosis and relieve increased intracranial pressure.
3. Four grams of sulfadiazine should be given during the first four hours, followed by one every four hours until there is complete symptomatic recovery. In favorable cases this usually requires five or six days.
4. If the patient is unable to take the drug by mouth it should be given in the same doses as sodium sulfadiazine in physiological solution of sodium chloride intravenously.
5. Enough fluid should be given so that the daily excretion of urine is 1,500 c.c.
6. Lumbar puncture should be done only for diagnosis, and repeated only to relieve the symptoms and signs of increased intracranial pressure or in case there is a failure of response to treatment.
7. It is desirable to maintain the blood level of free sulfadiazine at between 5 and 10 mgs. per 100 c.c.

Pneumococcal Meningitis

This is a disease which presents many difficulties in treatment, but encouraging results have been obtained during the past few years with combined specific serum and chemotherapy. The treatment of choice may be outlined as follows:

Summary of Treatment of Pneumococcal Meningitis

A. Diagnostic Procedures on All Patients

1. Blood culture.
2. Spinal fluid culture with the identification of the type of organism.
3. Examination of the ears, mastoid, and sinuses for foci of infection.

B. Therapeutic Procedures

1. Type-specific anti-pneumococcic rabbit serum (250,000 units) should be given intravenously until a positive balance of antibody is obtained (positive Sabin or Neufeld test on patient's serum).
2. Sulfapyridine or sulfadiazine should be given by mouth, 8 gm. per day. The cerebrospinal fluid should be maintained at a level of at least 8 mg. per 100 c.c.
3. Lumbar puncture should be performed at least once a day, or more often if signs of pressure develop.
4. Sulfapyridine sodium, 5 to 8 gm. per day, should be given intravenously if the patient is stuporous and cannot take the drug by mouth.

5. Surgical drainage of the focus of infection should be done if one is discovered.

With this treatment the fatality rate is now in the neighborhood of 30 to 50 per cent instead of 98 to 100 per cent.

The poorest results are obtained when the meningitis follows pneumonia, the failure in these cases being due to the fact that at least 50 per cent of the cases are associated with endocarditis, and that in the other cases the meningitis is only a part of a more widespread pneumococcal infection. The best results are obtained when no obvious focus of infection is present and the patient lives long enough for adequate treatment with serum and sulfonamides.

Hemolytic Streptococcal Meningitis

Until recently this was almost invariably a fatal disease, but now the fatality rate is in the neighborhood of 20 per cent. The salient features concerning this disease have been summarized elsewhere,[4] but the following points are well worth remembering.

1. This disease is seen most often under the age of two years and between the ages of five and twenty.

2. The commonest source of infection is in the middle ear. Less commonly infection occurs following sinus infections, skull fractures, or operations on the brain.

3. Bacteremia is common, especially when there is an associated lateral sinus thrombosis or bacterial endocarditis. Hematogenous infection of the meninges by this organism is infrequent.

4. Factors influencing recovery are the age of the patient, accessibility of the focus of infection for drainage, and chemotherapy.

Summary of Treatment of Hemolytic Streptococcal Meningitis

A. Diagnostic Procedures

1. Lumbar puncture on all patients.
2. Blood culture.
3. Examination of ears, mastoid, and paranasal sinuses for portal of entry.

B. Therapeutic Procedures

1. Sulfanilamide or sulfadiazine by mouth, 8 gm. per day.
2. Lumbar puncture for diagnosis, and then once every twenty-four hours until the fluid is sterile. If the symptoms of increased intracranial pressure are present, it should be done more often.
3. Surgical drainage of foci of infection, usually in the mastoid or lateral sinus, less often in the frontal or ethmoid sinus.
4. Repeated blood transfusions for anemia.
5. It may be necessary to continue active treatment for three to six weeks or longer.

Influenza Bacillus Meningitis

This type of meningitis is of special interest to pediatricians since 85 per cent of all the cases occur under the age of three. Moreover, it is one of the commonest causes of sporadic cases of meningitis, and may be confused with meningococcal meningitis. Prior to the introduction of the sulfonamides and specific serum, this disease was almost invariably fatal. Now, with the combined use of sulfanilamide and specific serum, the fatality rate has been reduced to about 50 per cent. The treatment as recommended by Alexander [1] would appear to be the most adequate one for the present. It may be summarized as follows.

Summary of Treatment of Influenza Bacillus Meningitis

A. Diagnostic Procedures

1. Blood culture.
2. Spinal fluid culture and smears.
3. Lumbar puncture at least every twenty-four hours.

B. Therapeutic Procedures

1. Specific antiserum (rabbit) until the blood is cleared and there is a positive balance of antibody in the circulating blood. Usually at least 100 mg. of antibody nitrogen is required for the initial dose.
2. Sulfapyridine by mouth so that the level is at least 8 mg. per 100 c.c. in the spinal fluid; that is, 2 gm. per day for small children and 4 gm. per day for older children. This should be continued until the spinal fluid is sterile.
3. Supportive treatment such as maintaining nutrition and preventing anemia is important.

The treatment recommended by Alexander for infants and children may be summarized as follows:

1. One-tenth gram of sulfanilamide per kilo-

gram of body weight is given by intravenous drip as soon as the diagnosis is made. This is followed by 0.1 gm. per kilogram in 40 c.c. of Ringer's solution every four hours.

2. Fluids are forced for at least three hours before serum is administered.

3. Twenty-five milligrams of antibody nitrogen is given intravenously and 75 mg. is diluted in 200 to 300 c.c. of Ringer's solution and given by intravenous drip over a two-hour period.

4. Lumbar punctures are performed daily and serum is discontinued if the spinal fluid is sterile, the sugar and chlorides are rising, and the protein and cell count are falling, and the concentration of 1:10 dilution of the patient's serum produces capsular swelling.

Pneumonia

Pneumococcal Pneumonia

There are three chemotherapeutic agents which are equally effective in pneumococcal pneumonia: sulfapyridine, sulfathiazole, and sulfadiazine. They all decrease the fatality rate, shorten the course of the disease, and reduce the number of complications. Of the three compounds, sulfadiazine causes the least toxic effects. There are fewer cases of hematuria, less nausea and vomiting, dermatitis, and drug fever. Anemia and leukopenia are infrequent, and whereas renal colic and anuria may occur they are less common than following the use of sulfathiazole or sulfapyridine. In short, in the treatment of pneumococcal pneumonia, sulfadiazine would seem to be the drug of choice for the present. The reasons for selecting it in preference to sulfapyridine or sulfathiazole are therefore twofold: it is as effective, and it produces fewer toxic effects.

The dosage is the same as that of the other sulfonamides; for example, 6 gm. a day until the temperature remains normal for at least two days. Sodium sulfadiazine may be used when patients fail to tolerate the drug by mouth.

Hemolytic Streptococcal Pneumonia

The two drugs which have had a clinical trial in hemolytic streptococcal pneumonia are sulfanilamide and sulfadiazine. From the available evidence it would appear that sulfadiazine is more effective and less toxic than sulfanilamide. There are substantial reasons for believing that the fatality rate in hemolytic streptococcal pneumonia and empyema may be appreciably reduced following chemotherapy and that the course of the disease may, in many cases, be shortened. So far, the evidence is not convincing that the incidence of empyema following hemolytic streptococcal infection of the lungs is reduced by chemotherapy. An increasing number of cases of empyema have been recorded in which recovery occurred following multiple aspiration of the chest and chemotherapy. In the majority of cases, however, it is necessary sooner or later to establish free drainage in order to effect a cure.

Staphylococcus Aureus Pneumonia

This type of pneumonia is relatively uncommon, but during the past year, following the epidemic of influenza which was prevalent in Boston, a number of cases were observed.[3] Many of these patients developed an extensive bronchopneumonia with abscess formation and empyema. Finland reported that recovery followed chemotherapy in a number of cases and that improvement was prompt and recovery complete. In a few, the illness was prolonged, especially when there was evidence of abscess formation and localized pleural effusion. In some cases, the original pleural fluid was sterile and remained so; in others it soon became infected with staphylococci. Here again there were some cases in which recovery from empyema followed completely after repeated aspirations and chemotherapy; in others surgical drainage of the pleural cavity was necessary before recovery followed. It would appear that either sulfadiazine or sulfathiazole should be used in Staphylococcus aureus pneumonia, since they are both effective in some degree in the treatment of S. aureus infections in general.

Friedländer's Bacillus Pneumonia

Pneumonias due to this organism are usually serious infections, and while chemotherapy has been used in a number of them, the evidence is slight that any of the sulfonamides except sulfadiazine shorten the course of the disease. Perhaps the combined use of serum and chemotherapy in this type of pneumonia will produce better results.[10]

In summing up the treatment of pneumonia with chemotherapeutic agents it would appear at the present time that sulfadiazine is the most effective of all the sulfonamides in the treatment of pneumococcal, hemolytic strep-

tococcal, Staphylococcus aureus, and Friedländer's bacillus pneumonia. The most striking results are obtained in the treatment of pneumococcal pneumonia.

Wound Infections

The first consideration in the treatment of any wound infection is to determine the causative organism, the common ones being the hemolytic streptococcus, Staphylococcus aureus, Clostridium welchii, and the micro-aerophilic hemolytic streptococci. In a number of cases, however, there may be secondary contaminants of the proteus of pyocyaneous group or B. coli. There has been great interest in the treatment of wound infections, especially among soldiers and sailors as well as civilians in countries at war. Studies have been carried out along two different lines: first, chemoprophylaxis; and second, chemotherapy.

In regard to chemoprophylaxis, powdered sulfanilamide has been placed directly in the wound and given by mouth. When this procedure is adopted soon after an individual has been wounded, the incidence as well as the severity of the local infection seems to be reduced. Once infection has become established in a wound, however, there seems to be no valid evidence that chemotherapy applied locally accelerates the healing of wounds. This, however, is a matter which requires additional study and investigation.

It has been shown by Colonel Colebrook[2] of the British Army that many wounds which showed delayed healing were infected with hemolytic streptococci. Sulfanilamide treatment of these wounds has been of great value in promotion of healing.

Gas-bacillus infections seem to be best handled by excision of all necrotic tissue, the use of sulfanilamide locally and by mouth, and the injection of antitoxin. One cannot state as yet whether these forms of treatment will greatly reduce the fatality rate in true gas-bacillus gangrene. The micro-aerophilic hemolytic streptococcal infections are best treated by the local application of zinc peroxide paste as recommended by Meleney.[9] Many of them require in addition sulfanilamide by mouth.

One may sum up the treatment of wound infections with the sulfonamides by saying that they have been used to best advantage as a prophylactic in war wounds. They are also of value when applied locally and given by mouth in patients with active infection of wounds. The use of antitoxin and sulfonamides continues to remain the treatment of choice in gas-bacillus infections. Zinc peroxide paste with sulfanilamide is the best method for the treatment of micro-aerophilic hemolytic streptococcal infections.

Gastro-intestinal Infections

The greatest advance in the treatment of gastro-intestinal infections has been the development and use of sulfaguanidine in the treatment of bacillary dysentery. This drug can be given in large amounts and is not readily absorbed from the gastro-intestinal tract. Its concentration, therefore, remains high in the tract, and in this way it inhibits the growth of pathogenic dysentery bacilli. Studies of Marshall et al.[7,8] and Lyons[6] indicate that the duration of the fever is shortened and the signs of intoxication and the number of stools are reduced within a few days after the exhibition of sulfaguanidine, and on the whole the disease is shortened by the use of this drug. It has been of little value in the treatment of chronic ulcerative colitis of unknown etiology and the results of its use as a prophylactic against peritonitis in resections of the large bowel have been disappointing.

There are isolated cases on record in which carriers of typhoid bacilli have been sterilized following the use of sulfaguanidine by mouth.[5]

The greatest field of application of sulfaguanidine at present appears to be in the treatment of acute bacillary dysentery. There is no evidence now available which indicates its value in the treatment of typhoid fever; however, since typhoid fever is a disease in which there is a wide dissemination of organisms throughout the body, it is doubtful whether sulfaguanidine would have a highly beneficial effect, since very little of it is absorbed. It may be that the combination of sulfaguanidine and one of the other more soluble sulfonamide drugs such as sulfadiazine may be an effective method of treatment.

TABLE I. FREQUENCY OF TOXIC REACTIONS FOLLOWING VARIOUS SULFONAMIDES

Toxic Reactions	Sulfanilamide	Sulfapyridine	Sulfathiazole	Sulfanilylguanidine	Sulfadiazine
Nausea and/or vomiting	10–20%	40–55%	23–40%	2–5%	5–9%
Mental disturbances including toxic psychosis	5–10%	0.3–5%	0–2%	None	0
Skin eruption	2–5%	4–5%	8–10%	Occasional	2-3%
Fever	10%	2–5%	5–6%	Occasional	1%
Conjunctivitis			4%		
Anemia	1–2%	2–3%	Very rare	Not reported	Not described
Hyperleukocytosis	With acute hemolytic anemia			Not reported	Not described
Leukopenia	0.1%	0.1–0.5%	Rare	Not reported	2%
Hematuria	0	2–3%	2–3%		0.5–1%
Oliguria	0	0.1–0.5%	0.5–1%		0.5–1%
Anuria with nitrogen retention	0		0.5–1%		0.5–1%
Jaundice	Rare		Rare		
Hepatitis	Rare		Rare		
Miscellaneous rare side effects:					
Purpura hemorrhagica	Rare	Rare		Not	Not
Gastro-intestinal bleeding	Occasional	Occasional			
Stomatitis	Rare	Rare		reported	reported
Painful joints			Rare		
Neuritis					

Urinary-Tract Infections

It is now generally recognized that infections of the urinary tract due to the colon bacillus, B. proteus, B. influenzæ, B. dysenteriæ, and Staphylococcus aureus, are favorably influenced by the use of chemotherapeutic agents. Either sulfathiazole or sulfadiazine is effective in the treatment of these various infections, but in all of them it is extremely important to determine whether or not there is an anatomical lesion in the genito-urinary tract which is causing obstruction.

Discussion

The Choice of the Sulfonamides in Treatment

In choosing one of the sulfonamides for treatment it is wise to select the one that will be most effective for a given infection and will cause the fewest signs of intoxication. From the evidence at present there seems to be little doubt that sulfadiazine has a broader base and causes fewer signs of intoxication than has either sulfapyridine or sulfathiazole. This is especially true in hemolytic streptococcal, pneumococcal, staphylococcal, and meningococcal infections. In bacillary dysentery, sulfaguanidine is the most effective sulfonamide in the treatment of both the acute disease and in the carriers of the responsible organism.

Specific serum and chemotherapy should be used in treating all cases of pneumococcus and B. influenzæ meningitis. It should also be used in some cases of pneumococcal pneumonia.

The Toxic Effects of the Sulfonamides

Every physician who uses the sulfonamide drugs knows that certain side effects are common. The most important ones, summarized in Table I, are those involving the hematopoietic organs and urinary tract. It is essential, therefore, to follow the blood and urine in all patients who are receiving these drugs.

Summary and Conclusions

The methods of treatment are outlined which are in common use in the treatment of various

infections frequent in medical practice. From the evidence available at present it would appear that sulfadiazine is the drug of choice in the treatment of most of the common infections which respond to the sulfonamide drugs. It is effective and causes fewer signs of toxicity than do the other sulfonamides.

Sulfaguanidine is the drug of choice in the treatment of bacillary dysentery and carriers of Shigella dysenteriæ.

Specific serum and chemotherapy should be used in cases of pneumococcus and B. influenzæ meningitis.

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Arthritis—A Curable Disease?*

By Russell L. Cecil, M.D.
New York City

RUSSELL L. CECIL, M.D.

B.A., Princeton University, 1902; M.D. Medical College of Virginia, 1906; Sc.D., Medical College of Virginia, 1928. Entered Army in June, 1917; served as Director of Laboratories at Camp Upton, N. Y., and Camp Wheeler, Georgia; served at Army Medical School and appointed Head of Commission for Study of Pneumonia by Surgeon General, 1917 to 1919. He is now Professor of Clinical Medicine, Cornell University Medical School; Professor of Medicine, Polyclinic Medical School and Hospital; he also holds several other important appointments. Doctor Cecil has published several works on the subjects of pneumonia, arthritis and rheumatism.

■ There is an ancient saying in medicine which reads that "Once an arthritic, always an arthritic." This generalization, however, is not entirely accurate. In the first place, arthritis is merely a name for a group of diseases, some of which are much more severe and intractable to treatment than others. For example, the arthritis which we occasionally see as a complication of gonococcal or meningococcal infections, is very quickly cured by modern chemotherapy. The arthritis of rheumatic fever yields promptly to salicylates, and now we are finding that this disease can actually be prevented by small daily doses of one of the sulfonamide drugs. On the other hand, rheumatoid or deforming arthritis is one of our most difficult therapeutic problems. Osteo-arthritis can be very much helped symptomatically, but the bony changes persist in spite of all therapy. It is obvious, therefore, that the question which we have propounded in the title of this paper, namely, Is arthritis a curable disease? necessitates a qualified answer. Arthritis is curable and incurable, depending, as the case may be, on many factors such as etiology, age and temperament of the patient, and many environmental factors, such as climate, financial status, facilities for treatment, et cetera.

Arthritis has been classified in various ways, but recently the Committee on Classification of the American Rheumatism Association has composed a comparatively simple one, which I submit below. This classification has not yet been finally accepted, but it is quite likely that it will be endorsed, with possibly minor modifications.

*Address delivered before the Michigan State Medical Society, Grand Rapids, Michigan, September 17, 1941.

Classification of Diseases Involving the Joints

I. Arthritis associated with specific infection.
II. Arthritis of rheumatic fever.
III. Rheumatoid arthritis (atrophic arthritis, chronic infectious arthritis, proliferative arthritis), including juvenile type (Still's disease) and ankylosing spondylitis (Marie-Strümpell).
IV. Degenerative joint disease (degenerative arthritis, osteo-arthritis, hypertrophic arthritis, senescent arthritis).
V. Arthritis of immediate traumatic origin.
VI. Arthritis of gout.
VII. Arthritis of neuropathic origin (Charcot's joint).
VIII. Neoplasms of joints.
IX. Miscellaneous forms.

I. *Arthritis Associated with Specific Infection.*—Almost any pathogenic organism can be the cause of an infectious arthritis. Many of them, such as the pneumococcus or the hemolytic streptococcus, are likely to set up acute suppuration in the joint. Others, such as the tubercle bacillus and the Treponema pallidum, produce chronic inflammatory changes. Meningococcus and gonococcus arthritis are readily controlled by sulfathiazole or some other sulfonamide agent. If this fails, the drug should be supplemented by fever therapy. The real surgical joints are usually treated by arthrotomy and drainage. Luetic joints present more difficult problems, but when handled properly at the outset by well established orthopedic measures, supplemented by specific therapy, they usually yield fairly promptly to treatment. Tuberculous arthritis, incidentally, is becoming a rare disease, the result, no doubt, of the great drop in the incidence of tuberculosis.

There is a third type of arthritis caused by infection. It is sometimes spoken of as "focal infection arthritis" and occurs after a general or local infection in some other part of the body. It is particularly common after tonsillitis or sinusitis, or extensive infection about the teeth. This rather unusual form of arthritis generally yields to rest, physiotherapy and the removal or natural disappearance of the original focus.

II. *Rheumatic Fever.*—**The arthritis of rheumatic fever is readily controlled by salicylates, but the disease, rheumatic fever, as it exhibits itself in the heart and blood vessels, is a chronic granulomatous inflammatory process which does not yield to any form of treatment, but goes ahead to produce chronic fibrous changes in the valves of the heart, the myocardium and the blood vessels. In the real sense of the word, therefore, rheumatic fever is not a curable disease. Until the etiology and the pathogenesis of rheumatic fever are better understood, it is doubtful if the treatment will ever be entirely satisfactory. Medical opinion is quite unanimous that the sulfonamide drugs are useless in controlling the disease, except when employed in small daily doses to prevent the disease in children. It has been conclusively shown by Coburn[1] and others that when 1 to 1.5 grams of sulfanilamide are administered daily, acute streptococcus infections of the respiratory tract can be prevented, and this in turn will prevent the development of rheumatic fever. Rheumatic fever cannot be prevented if sulfanilamide is administered after streptococcus infection has taken place.**

III. *Rheumatoid Arthritis.*—Is rheumatoid arthritis a curable disease? This question has been much debated. Forestier[2] says that less than two per cent of rheumatoid patients achieve a complete and permanent cure. On the other hand some clinicians think that a much higher percentage, 10 to 15 per cent, recover from the disease. Certainly a considerable number of patients with rheumatoid arthritis have remissions, during which they are free of pain and swelling in the joints. These remissions are likely to come fairly early in the course of the disease and sometimes last for several years. Patients who have had rheumatoid arthritis for five to six years rarely get natural remissions. When the disease becomes inactive at this late stage, it seems quite natural to assume that it results from some particular form of therapy.

What are the factors which tend to bring about inactivity or cure in rheumatoid arthritis?

First I should mention the temperament and constitution of the patient himself. It is often said that rheumatoid arthritis usually attacks individuals of inferior constitutional make-up. This in a sense is true, though I can recall numerous exceptions. In my own practice I have seen a number of magnificent specimens, both male and female, afflicted with arthritis. However, these fine physical types usually respond better to treatment than the inferior types.

A second important factor is concerned with environmental influences, such as climate, home

life, and the financial ability of the patient to obtain the proper kind of treatment.

With respect to climate, I wish we knew just how many patients who go to a tropical or subtropical climate obtain complete cure of their arthritis. Unfortunately there are no accurate figures available which give us this information. Naturally it would take a long and careful follow-up study to obtain it, and so far as I know, it has never been done anywhere. However, I suspect from my own personal experience that even in the case of those patients who respond most conspicuously to a warm climate, relapse sooner or later occurs when they return to their usual climatic environment.

The factor of home environment is very important, not only because it brings in the question of duties and home responsibilities of the wife and mother, but also the more profound problem of temperamental congeniality between husband and wife, parents and children, et cetera. We have heard a great deal in recent years concerning the importance of psychic shock in the etiology of rheumatoid arthritis, and personally I feel that psychic traumas, both great and small, play a much more significant role than focal infection or some of the other factors which have been stressed in the past.

The financial status of the patient is another factor which plays a large part in the recovery of the arthritic patient. Last spring, at a symposium on arthritis before the American College of Physicians in Boston, I remarked that most of the patients with rheumatoid arthritis that we see in New York belong to the low income group. In this respect the victims of rheumatoid arthritis are similar to those of its first cousin, rheumatic fever, a disease which we have long recognized as being most prevalent among the children of the poor. If poverty predisposes to rheumatoid arthritis, it certainly limits as well the patient's ability to obtain the best treatment. Let us assume the following conversation between doctor and rheumatoid patient:

Physician: "You must go into a hospital or sanitarium and have six to eight weeks of complete rest in bed with intensive therapy."

Patient: "I can't afford the expense attached to such treatment."

Physician: "Then you must rest at home and have a nurse visit you and give you physiotherapy, massage and exercises."

Patient: "I can't afford to stop work; otherwise my family would starve."

Physician: "You must have vitamin D and gold salts. The druggist usually charges you about $6 a box for vitamin D capsules and $2.00 an ampoule for gold salts."

Patient: "I can't afford such expensive medication."

This hypothetical conversation gives only a faint idea of the financial difficulties which confront physician and patient in the proper handling of rheumatoid arthritis.

What are some of the specific factors which we have found most helpful in bringing about remissions in rheumatoid arthritis?

(1) Statistics show that results are better when patients are treated early than they are when patients have had the disease for several years. In this respect arthritis is no different from tuberculosis, syphilis and other chronic diseases.

(2) Rheumatoid arthritis seems to be more amenable to control when it develops later in life than when it develops in the third or fourth decade. Forestier speaks of it as the "benign arthritis of old age."

(3) I am quite convinced that we see many more remissions in rheumatoid arthritis since we began using gold salts for this disease. In statistics which we recently prepared on 235 cases of rheumatoid arthritis treated with gold therapy, 31 per cent had complete remissions and 35 per cent were greatly improved. In cases of less than one year's duration, gold therapy brought about a complete remission of symptoms in approximately 40 per cent of the cases.

Unfortunately, many of these patients sooner or later sustained a relapse. The exact percentage was 34 per cent, about one-third of the remissions. A majority of the relapses occurred within a few weeks or few months after cessation of gold therapy. However, a careful analysis of the patients who had remissions showed that 52 per cent remained free of symptoms for over one year, and a few for over five years. It was not always easy to say just why relapse occurred. Indeed, in many cases no cause could be discovered. In others, however, it was obvious that relapse was due to overwork, acute respiratory infections, emotional trauma, surgical operation or childbirth. Undoubtedly one of the easiest ways

to have a relapse in arthritis is to contract a sharp attack of influenza. This will often be followed by a recurrence of arthritic symptoms and it can happen without any obvious complicating "foci of infection" such as sinusitis, otitis, bronchitis, et cetera. In other words, the influenza virus itself appears to be sufficient to initiate a recurrence of joint symptoms. Fortunately the relapses are nearly always milder than the original attack and they too are amenable to gold therapy, though patients in relapse do not appear to react quite so promptly to gold salts as they did during the original attack.

As a result of our experience with gold salts, we believe that in spite of its well recognized dangers, the beneficial effect which it often produces on the arthritic patient justifies its use in those who can tolerate the drug. Unfortunately there are some (less than 10 per cent) who are so sensitive to gold that the treatment has to be abandoned. Such patients may develop an intractable and sometimes severe dermatitis or stomatitis; in others, intolerance to gold may show itself in the form of a leukopenia or thrombocytopenia. In such patients, of course, the gold injections have to be discontinued at once.

IV. *Degenerative joint disease,* or osteo-arthritis as it is more frequently called, exists in practically 100 per cent of elderly people, but fortunately produces no symptoms of pain or swelling in the majority of instances. This condition is now generally looked upon as a disease of wear and tear, and as a rule it is only in those cases where the worn-out joints are abused that symptoms develop. In other cases the menopausal syndrome, constipation, dietary indiscretions, et cetera, may be responsible for pain in these joints, even though the traumatic factor is absent.

Osteo-arthritis is a condition which yields fairly well to treatment in most cases, though there are some types, such as osteo-arthritis of the hip, which are quite intractable. To be sure, the actual pathological changes in the joint are not affected by therapy, and the hypertrophic lipping and spurs which occur in such obvious locations as the ends of the fingers in Heberden's nodes cannot be removed by heat, drugs or any other form of treatment. However, patients will not worry, as a rule, about the pathologic changes in their joints, provided these changes cause no pain or discomfort. By the use of rest, heat in various forms, iodides, deep x-ray therapy, et cetera, the physician is able to relieve these patients of most, if not all, of their discomfort. Rest is the most important single factor. Several weeks in bed would cure a great many patients of osteoarthritis in the weight-bearing joints. Next in importance comes physiotherapy in its various forms. Hot applications, including diathermy and short wave, are very valuable, but hydrotherapy is perhaps even more helpful. These patients are greatly benefited by spa treatment. Iodides still hold their popularity in many clinics. We make use of potassium iodide or hydriodic acid, preferably the latter. Iodides do not help all cases, but certainly work wonders sometimes. Deep x-ray therapy has its enthusiasts and may occasionally prove beneficial.

VI. *Arthritis of Gout.* When it comes to the question of the curability of gouty arthritis, we can be a little more dogmatic in our answer and say that while the gouty diathesis is incurable, gout in its acute form is readily controlled by modern therapy. Five to ten doses of colchicine, 1/100 grain by mouth every two to three hours, is usually sufficient to bring about a rapid disappearance of a swollen painful joint. As a rule we continue colchicine until the patient develops signs of intestinal irritation and diarrhea. In addition to the colchicine, sodium salicylate or aspirin may be given to relieve pain temporarily. Cinchophen, 7½ grains three times daily, accelerates the excretion of uric acid. The diet should be low in purins and fats and rich in proteins, such as milk, eggs and cheese.

Chronic tophaceous gout presents much more of a problem than acute gout. Perhaps we can summarize the situation best by saying that no patient should be permitted to develop chronic gout. In other words, by making use of the proper prophylactic measures, chiefly dietary, it should be possible to prevent a large majority of gouty individuals from ever developing chronic gouty arthritis. The first goal of the physician should be a reduction of the blood uric acid to normal limits, one to three milligrams per cent if possible. The character of the diet would depend a good deal on the susceptibility of the patient and the severity of his gout. In elderly pa-

tients, a simple reduction of the purins by the elimination of certain foods, such as red meat, liver, kidneys, sweetbreads, et cetera, may keep the patient comfortable. Gout, like diabetes, is usually more severe in young people, and more stringent measures will have to be employed. Patients should be on a rigid diet, which means of course elimination of nearly all meat, reduction in the amount of fat intake, and the elimination of certain vegetables, such as peas, beans, asparagus, et cetera. It is worth while to note that most authorities now permit tea and coffee in the low purin diet.

Not much remains to be said about the curability of arthritis. I have indicated that the prognosis in arthritis depends on the type of arthritis and also on certain environmental factors and the quality of the treatment. There are various other joint conditions, of which time does not permit a discussion. Traumatic arthritis, intermittent hydrops, allergic arthritis, arthritis psoriatica, et cetera, are all interesting conditions, but cannot be gone into at the present time. Then there is the large group of mechanical disturbances in the joint which are strictly orthopedic problems. Finally, there are the joint manifestations of other diseases, such as acromegaly, erythema multiforme, purpura, et cetera, in which joint manifestations go hand in hand with the progress of the disease itself. In this discussion I have stressed the more important of the prevalent forms of genuine arthritis.

Arthritis has a bad reputation with the practitioner. His general reaction is one of pessimism. However, I hope that I have been able to indicate that the outlook is brighter than it used to be, and that we can look for still more progress in time to come.

33 East 61st Street

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NURSE SCHOLARSHIPS GIVEN

Two students enrolled in the five-year nurse-training program at Wayne University have been awarded cash scholarships to aid in covering expenses of the current semester. The scholarships were given by the Detroit chapters of two international women's organizations.—*Wayne University Newsletter.*

Medical Service in Small Industries*

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M.D., George Washington University Medical School, 1906. Served in the United States Public Health Service from 1907 until 1920. During part of this time was detailed as Chief Surgeon of the United States Bureau of Mines, and later, Head of the Office of Occuptational Diseases in the Public Health Service. Mostly engaged in field work doing investigations in industrial hygiene. Conducted the first studies in this country on silicosis. 1920 became Medical Director of the Hydraulic Steel Company of Cleveland. In 1921 was appointed a special Staff member of the International Health Board of the Rockefeller Foundation, and was detailed as Adviser in industrial hygiene for the Commonwealth Government of Australia. In 1926 was appointed Assistant Medical Director of the Metropolitan Life Insurance Company. At present time is a member of the Council of the American Medical Association on Industrial Health. Member of the Sub-committee on Industrial Health of the Health and Medical Committee, Federal Security Agency. Chairman of the Medical Committee of the Air Hygiene Foundation.

■ WE are so accustomed to thinking in large numbers and in large terms that there is always a tendency to overlook not only the needs but the existence of small organizations. The excellence of medical service for employes of many large industrial firms is familiar to everyone, and when industrial medical service is discussed, it is this type of service which we have mostly in mind. Recently emphasis has been placed upon the fact that the majority of American wage earners are employed in small plants which have little or nothing of the type of health service which has become so integral a part of large industries. Eighty per cent of all wage earners are employed in plants of less than 1,000 employes and 97 per cent of all manufacturing concerns employ fewer than 250 men.

The occupational hazards of the small plant are the same as in the large plant but in the former supervision and control of actual or potential hazards are usually much less or lacking entirely. Not infrequently minor hazards are not recognized and major hazards may produce serious and even fatal results before the occupational factor is suspected. Over and above the

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occupational disease factor is the tremendous loss arising from illness of all kinds among industrial workers. The wastage in health, time and money is enormous but is not appreciated because it occurs in driblets. While it may be true that some employers are ignorant of or unconcerned about occupational hazards and the general health of their employes, most of them are concerned but have not been able to do much about it in view of the lack of accurate information and of available service.

The protection of the lives of wage earners in small establishments and the guarding of their health has attracted the attention of many different agencies. The national defense program has thrown a searchlight on every phase of production. Time loss from sickness in our industries is a major item of wastage and amounts roughly to one and one-fourth million work years per year. The Committee on Industrial Health of the Federal Security Agency has well in mind the importance of the numerous and various types of industry which contribute in any way to national defense and is paying particular attention to the small industry. It emphasizes the fact that the health and medical supervision of the employes in these industries is as important as any other factor in the defense program, and furthermore, that the physicians, engineers, hygienists, and other technicians upon whom devolves the responsibility for employe health and safety, have a function as important as any that comes within the defense program. Fortunately, the defense program has stimulated agencies that were already endeavoring to deal with this situation as well as initiating some new lines of activity.

In accordance with the well established procedure for any successful undertaking in public health, a foundation of education is being laid to insure a sound and lasting program. These educational activities are now well under way and are directed toward industrialists, wage earners, engineers and physicians, as well as some general information directed to the public at large.

Sickness arising out of occupation has been made compensable in most of the industrial states. This has served to focus the attention of the industrialist upon the economic aspects of ill health among his employes, whether occupational or not, and in the medical profession has aroused an interest not only in the clinical phases of the problem but the preventive as well.

Within the last few years, the American Medical Association has set up a permanent Council on Industrial Health, one of whose functions is to further the progress of health service in industry by concerted effort throughout the whole medical profession. As a result, committees on industrial health have been organized in some thirty or more state medical associations. The Council also sponsors an annual congress on industrial health and keeps actively in touch with both national and local developments in its field. The Public Health Service, which has long had a Division of Industrial Hygiene, has been instrumental in organizing similar divisions in State Departments of Health, so that there are at present at least forty such divisions in the various states, including those in State Departments of Labor.

The Industrial Hygiene Foundation is sponsoring a study of sick absenteeism in industry, in coöperation with the Public Health Service, which, it is hoped, by revealing the nature and extent of the health problem in industry, may help to define methods for the control of sickness and to extend industrial health services. I will not attempt to list all the other agencies which are concerned with one or another phase of this whole situation.

The realization of the needs of small industries and the effort to satisfy those needs are not new. Fifteen years ago, my colleague, Dr. McConnell, under the auspices of the Philadelphia Health Council, organized a consulting health service for small plants. Five hundred employes, however they might be divided in different plants, constituted a unit. For each unit, there was a nurse, and for each two units, a physician. Health lectures, first aid instruction, supervision of plant hygiene, and physical examinations were included in this service and each plant received three hours of health work a week per one hundred employes. The cost was $4.50 per employe per year. It was expected that individual industries would take over this scheme and carry it on themselves if and when they became capable of carrying it on.

This service was later separated from the Phil-

adelphia Health Council and was continued on a private consulting basis by Dr. McConnell's successor, Dr. Everts, who has described it in detail in the *Journal of the American Medical Association* of February 25, 1939. Some of the original firms that participated in this plan, I am informed, are still using it. I mention this to show that one type of service, designed for small plants, worked. Had it had behind it the interest and impetus it would have received under present-day conditions, I am sure it would have had a more far-reaching result in stimulating other similar schemes.

There are two main plans by which the small plant may organize an industrial medical service.

There is the individual physician, usually located in a convenient situation, who gives part time to one or more industrial plants, upon a pre-arranged basis. Such a physician usually is engaged in private practice also but not necessarily. A frequent arrangement is that the physician be on call with respect to the industrial establishment he serves, a first aid man or nurse taking care of minor routine work and summoning the physician when he is needed, and arranging to send other employes to the doctor's office for physical examination or treatment. This is an arrangement of limited value.

It is much more desirable that the physician call at the plant at stated hours and perform as much of his work as practicable in the plant. This serves to identify him with the establishment and not only makes him more familiar to the employes but gives him the opportunity of becoming familiar with the conditions under which they work. All of which tends to increase the confidence of the employes in the physician.

The second plan is where several physicians form a group and arrange to take care of neighboring industries according to their requirements. Such a group frequently includes several specialists and thus may be equipped to meet all the needs of industrial medical service and in many cases their work is of the highest order. Usually, however, such groups cannot be formed except in fair sized communities and consequently do not solve the problem of the small industry in a small community.

One other plan has occasionally been advocated and has, I believe, been tried a few times with no success, and that is to have a group of small industries combine to set up a common medical unit for making physical examinations, looking after plant hygiene, and fulfilling the usual functions of industrial medicine. Apparently this type of arrangement does not appeal to most plant managements; they prefer to make their own arrangements with the physician or physicians of their choice and without respect to other industries in the neighborhood.

The important thing in industrial medical service, especially in small plants, is not an elaborate setup but an appreciation on the part of the physician of the importance of working conditions in relation to the health of the workmen. He need not be an accomplished toxicologist nor an organic chemist but he should know what, if any, substances or exposures may be present in the plant which may possibly cause illness and what the symptoms of such illness may be.

He should have an understanding of the rôle of environmental conditions, light, temperature, humidity, atmospheric pollution, as having a possible effect upon health. The physician should also carry on, by both the written and spoken word, education in health and hygiene. While the working environment is important from the health standpoint, the average wage earner is in his place of employment forty hours in a week of one hundred sixty-eight hours.

The phyician who serves industry must be able to steer a middle course, being neither unduly prone to ascribe to working conditions, symptoms or complaints not readily accounted for, nor failing to recognize the evidences of a strictly occupational disorder. The key to this situation lies in the word "etiology." The etiology of the purely occupational disease and of other illnesses which may be influenced by working conditions, lies in the workshop. The physician, even if he is serving only one or several small plants, who has no first hand knowledge of shop conditions is at a disadvantage in dealing with his industrial patients.

The difference between medical service in a small plant and in a large one should be a difference in quantity only and not in quality. Preemployment physical examinations are just as important in the one as in the other, and periodic examinations, at least of those workers exposed

to a health hazard, is just as essential whether we are dealing with fifty men or five hundred. The equipment of the small plant medical department is necessarily simple and there is no need for it to be otherwise. Any case requiring specialized diagnostic procedures will be infrequent and should be referred to the proper specialist.

A full time nurse is not only advisable but in all but the smallest plants a necessity. It goes without saying that she should be a trained registered nurse. It is desirable that she should have some public health experience and some instruction in industrial nursing. It is essential that she have the type of personality and of disposition which enables the possessor to get along with people and to like them. The nurse is the eyes and ears of the doctor throughout the plant in his absence.

The functions and responsibilities of the first aid man or nurse, if any, should be carefully stated in writing by the physician, and comprehensive written orders should be posted in the medical department, and it is important that the physician see to it that these written orders are understood both by the nurse or first aid man, and by the plant management so that there is no likelihood that there will be any exceeding of authority in the physician's absence.

The matter of records is most important. Every transaction or treatment, either by the physician or his assistant, should be recorded and a weekly or monthly summary prepared. One of the main reasons why industrial management may fail to appreciate the importance and scope of the medical department is because the executives do not receive concise, informative, periodical reports of what the medical department is doing. This is just as important in a small plant as in one of ten thousand employes. It is advisable to have an individual record of each person in the plant and to summarize the absences and time lost from non-occupational accidents and illnesses as well as from those due to occupation. At the present time, sick absenteeism among industrial workers is receiving an attention long overdue. The duration and nature of disabling illness in a great many plants all over the country is being studied by the Public Health Service.

It is probable that there will be an increasing tendency for physicians to specialize in industrial medical practice but it is inevitable that the main reliance of the small industrial plant will be the local physician or group of physicians who can give a part time service. There is no reason why any qualified physician should hesitate to assume the responsibilities of industrial medical service provided he will learn the fundamentals of industrial hygiene, with special reference to the kind of industry he is serving.

It is in recognition of this that so much attention is being given at the present time to arousing the interests of physicians in industrial work and in acquainting them with the responsibilities and opportunities that fall to the lot of the physician who serves industry as well as providing him with essential technical training. In most of the state medical associations, committees on industrial health have been organized and are sponsoring educational activities among their members. Relationship with State bureaus of industrial hygiene and with schools and with technical groups of kindred interests have progressed to an active participation in conferences and surveys. There is available the medical knowledge and the technical engineering knowledge to provide the best hygienic facilities to every kind of industry. Progress is definitely being made and we are seeing the beginning of the extension of efficient and ethical medical service to the smaller and medium sized industries. Industrial medicine and industrial hygiene are assuming their proper status as one of the major phases of medicine and public health.

WAYNE MEDICAL STUDENTS APPLY FOR U. S. COMMISSIONS

Of the 68 senior students and 64 junior students in the Wayne University College of Medicine, more than 9 per cent have applied for commissions as reserve officers in the United States armed forces and Public Health Service. Most of those who have not applied are persons who cannot meet the age requirement or some other specification.

Brig. Gen. Lewis B. Hershey, head of Selective Service, recently announced that medical students in their last two years of college work would be offered Army and Navy commissions. Those accepted are to be deferred from military duty until they have completed their full training so that a stream of trained medical practitioners for the armed forces and civilian population may be assured.—*Wayne University Newsletter.*

A DEFENSE MEASURE

Nationwide Immunization Against Diphtheria and Smallpox

A MAJOR effort to secure the immunization of all children over nine months of age against diphtheria and smallpox has been recommended by the Child Welfare Committee of the State Society. This opportunity to prevent disastrous epidemics in Michigan, particularly in those areas having new defense plants and activities, is open to every MSMS member. The State Society urges the profession's wholehearted cooperation in this vital immunization campaign.

Plans for carrying on the program have been developed by the MSMS Child Welfare Committee, the Michigan Department of Health, and the Michigan Branch of the American Academy of Pediatrics. A deterrent in the immediate statewide immunization program, scheduled for completion by May 1, confronts the State Health Laboratories which are held up not only by lack of immunizing material but particularly because of an acute shortage of glassware; rubber bulbs and stoppers. Therefore, the coöperating agencies decided that the campaign should be started in the industrial defense areas, and as more material becomes available, it should be extended to other areas throughout the state. The first area is Wayne County (outside of Detroit), chosen as the defense area most in need of the immunization program. After the program has been completed in Wayne County, it will be extended to neighboring counties, and gradually throughout the state.

The immunizations will be performed by private physicians (physician-patient relationship).

Plans are being worked out for remuneration to county medical societies from limited federal funds, for immunization of indigents. The program in each county will be under the joint sponsorship of the county medical society and the district and city health departments.

Henry R Carstens

President, Michigan State Medical Society

President's Page

THE ANNUAL MICHIGAN POSTGRADUATE PROGRAM FOR GRADUATES IN MEDICINE

The Michigan State Medical Society, in coöperation with the University of Michigan Medical School, Wayne University College of Medicine, the Michigan Department of Health, and the Wayne County Medical Society, announces the postgraduate courses for 1942.

INTRAMURAL COURSES

University Hospital, Ann Arbor

	All dates inclusive
Allergy	May 11-15
Anatomy	February 12-May 28 (Thursdays)
Diseases of Blood and Blood Forming Organs	May 18-22
Diseases of the Heart	May 13-15
Electrocardiographic Diagnosis	November 16-21
Gastro-enterology	May 11-14
Laboratory Technique	Throughout year
Nutritional and Endocrine Diseases	November 2 - 5
Ophthalmology and Otolaryngology	April 23-29
Personal Courses	Throughout year
Roentgenology	April 13-18
Seminars on Clinical Examination of Heart	February 18, March 25

Wm. J. Seymour Hospital, Eloise
(For further information, write to the Continuation School of Wayne County, 4421 Woodward Avenue, Detroit.)

Seminars on Office Urology ..... April 8-29

Wm. J. Seymour Hospital, Eloise
(For further information, write to the Continuation School of Wayne County, 4421 Woodward Avenue, Detroit.)

Applied Anatomy—Section on Head and Neck.... March 18, June 3

Wayne University College of Medicine, Detroit
(For further information, write or call Dr. M. R. Collings, Wayne University College of Medicine, Detroit.)

Therapeutic Conferences ..... Beginning Thursday, February 5

Wayne University College of Medicine, Detroit
(For further information, write to the Department of Medicine and Pharmacology, Wayne University College of Medicine, Detroit.)

EXTRAMURAL COURSES

Bay City	March 30, April 6, 13, 20
Cadillac	April 3, 10, 17, 24
Flint	April 1, 8, 15, 22
Grand Rapids	April 2, 9, 16, 23
Jackson	March 31, April 7, 14, 21
Kalamazoo	March 31, April 7, 14, 21
Mt. Clemens	April 1, 8, 15, 22

Subjects

Approved new methods and drugs in medical and surgical conditions, with particular reference to present emergency. (Panel discussion.)
The therapeutics of whole blood, plasma, and serum.
Estrogenic (steroid) hormones.
Therapeutic problems in pediatrics.
Joint pain and its treatment.
Peptic ulcer. (Panel discussion.)

Ann Arbor ..... April 30, May 7, 14, and 21

Emergency and Traumatic Surgery.

Further information may be obtained upon request.

Committee on Postgraduate Medical Education
Room 2040, University Hospital
Ann Arbor, Michigan

EDITORIAL

A POSSIBLE SOLUTION

■ PROBABLY no section of the country is immune from some one or two physicians, who, in giving medical testimony, consciously avoid the truth, but this insignificant minority becomes a significant annoyance to the vast majority of honest doctors of medicine who pride themselves on their unassailable reputation for integrity in or out of court.

According to an article in *The Journal of American Insurance,* the Minnesota State Medical Association has a committee called the Committee on Medical Testimony who after thorough investigation take disciplinary action when needed. This varies from censures to recommendations to the State Board of Medical Examiners that the license of the offending physician be revoked. This committee has been given excellent coöperation by the Minnesota courts. The Justice of the Supreme Court of the State of Minnesota, stated, "You of the Minnesota State Medical Association have the credit of being the first to meet the issue professionally, constructively, and practically. The eyes of the whole American Bar and particularly of all state judicial councils will be, if they are not now, watching your experiment. You are in sole charge of it. We mere lawyers must stand by to render such aid as may be possible."

E. M. Hammes, M.D., of Saint Paul, is chairman of this committee. Dr. Hammes states succinctly, "Those who deliberately deviate from the truth on the witness stand are as guilty of unethical practice and as deserving of severe disciplinary measures, as those who violate other rules of ethical practice. I am positive that already there has been a softening of testimony by a few of the men who have been pretty liberal in their testimony in the past. These men know that there is a committee on medical testimony and they also know that excerpts from their testimony—if it shows any traces of dishonesty—in all probability will be referred to the committee by the court, by attorneys, or by physicians themselves. * * * * Medical testimony in Minnesota is of a very high standard but, unfortunately, a rare few need watching—and they realize they are being watched."

It might be well in Michigan that such a committee should function to clean our ranks of the few who forget the responsibilities of their profession.

KEEP 'EM ROLLING!

■ THE industries of Michigan now have over $3,000,000,000.00 in National Defense contracts. The life of our nation and its institutions, including the private practice of medicine, depends on maximum production. To achieve this enormous schedule of production our workers must be kept in the best possible physical condition.

A coöperative program for maintaining and improving the health of workers employed in the industries of our State, especially those employed in the smaller industries where full-time medical service is not or cannot be available has been developed by the Committee on Industrial Health of the Michigan State Medical Society and the Bureau of Industrial Hygiene of the Michigan Department of Health.

The Bureau of Industrial Hygiene, directed by K. E. Markuson, M.D., has been and is continuing to conduct studies to determine the various occupational hazards existing in the many industries in all parts of the State. The following procedure has been adopted:

The management will be requested to invite the physicians now serving in industry to inspect the plant while the study is being conducted. This invitation will be sent to you sufficiently in advance of the appointed time to allow you to arrange your schedule.

With the increase in the size of our armed forces we must anticipate the necessity for the employment of many young men with physical impairments as well as reëmployment of many in the older age groups. This means that greater emphasis must fall on examination and placement in industry so as to utilize both the physically fit and those with impairments to best advantage. Likewise, anticipating the employment of those with impairments, periodic examination will be needed more frequently. Your Committee would like to stress the importance of examination for the intelligent placement of men in our essential industries.

COMMITTEE ON INDUSTRIAL HEALTH,
M.S.M.S.

✶ YOU AND YOUR BUSINESS ✶

FIRST AID INSTRUCTORS NEEDED

Physicians who desire to aid in the task of giving training in First Aid to the thousands of men and women needed for Michigan's civilian defense can be certified as instructors merely by contacting their local Red Cross office, Dr. L. H. Gaston, deputy chief of the Emergency Medical Service of the Citizens' Defense Corps, Michigan Council of Defense, announced.

"Hundreds of physicians are already devoting their time and effort to this work," Dr. Gaston said. "However, many more are needed if proper and adequate instruction is to be given to the air raid wardens, auxiliary police and firemen, and other volunteers. First Aid is a basic requirement for twelve of the protective services."

Physicians should give to the Red Cross the following information: Full name, address, name of medical school and year of graduation. The information will be sent by the Red Cross to the Midwestern Area Office of the American Red Cross at St. Louis, Missouri, where the doctor's name will be certified. A certificate will then be returned to the doctor, usually in about ten days.

In many cases, the local Red Cross officials request the doctor to begin instruction classes immediately upon application for certification, Dr. Gaston pointed out.

THE PATIENT'S CONSENT IS NECESSARY

Without the written permission of the patient or a subpoena from the court, is a hospital which presents a patient's records as evidence in court liable to him for damages?

Generally speaking, a hospital which discloses, without proper authority therefor, facts contained in the clinical record of a patient, does so at its own peril. The extent of damages that a patient may sustain by reason of such disclosure, however, would of course vary. If a hospital disclosed that a patient had pneumonia, for instance, the patient might experience considerable difficulty in convincing a jury that he suffered any damages by reason of such disclosure. If, on the other hand, the patient was syphilitic or thought to be and that fact was disclosed, an entirely different picture would be presented. The same principle is involved in connection with the publication of a case history without the consent of the patient. It appears that only one case has arisen in which a hospital has been sued for a violation of a patient's right of privacy in connection with the disclosure of information (Bazemore v. Savannah Hospital [Ga.], 155 S. E. 194).

OSTEOPATHS PRACTICING IN MEDICAL HOSPITALS

The question of osteopaths practicing in medical hospitals was decided in the Circuit Court of Genesee County, October 20, 1937. The right of the Board of Managers of Hurley Hospital, Flint, a city institution, to refuse to allow osteopaths to practice in the hospital, was upheld by Circuit Judge Paul V. Gadola, who dismissed the motion of L. R. and H. H. Kesten, Flint osteopaths, who asked a court order allowing them to refer patients to, and practice in, the municipal institution. The Court held that the Board has the right to designate who may practice in the hospital as long as the designation is made by class and not against individuals.

The Superintendent of Hurley Hospital testified that the American College of Surgeons and the American Medical Association would refuse to approve the institution if osteopaths were admitted to practice therein. Many advantages would be lost, as for example, interns could not be used by the hospital; the staff of doctors of medicine might refuse their coöperation and support of the institution; the county medical society might withdraw its approval of the hospital, with the result that state cases, such as afflicted children, could not be hospitalized in the institution; the standing and activity of a quasi-public institution which would ordinarily be a great asset to the health and well-being of the people of the community, would be jeopardized by admitting one osteopath to practice therein.

ALLEGED NEGLIGENCE

Most malpractice suits are based on negligence and allege that the physician failed to comply with his implied contract or with one set up by statutory law. For example, the allegation may

be a want of professional skill or knowledge or, on the other hand, negligence in not applying the skill or knowledge possessed. A physician may also be sued for malpractice because of the acts of his assistants or employes.

Of the many suits instituted in which it is claimed that the physician was negligent in not having availed himself of the use of the x-ray as a diagnostic measure, fracture cases are still in the majority.—SAMUEL WRIGHT DONALDSON, M.D., *The Roentgenologist in Court.*

MEDICAL CARE FOR RECIPIENTS OF OLD AGE ASSISTANCE, ET AL.

Medical care for recipients of public assistance in the federal categories (Old Age, Aid to the Blind, Aid to Dependent Children), was urged by Senator Green of Rhode Island, in a recent address to the U. S. Senate in which he stated:

> Some provision should be made for State and local agencies to authorize medical care by regular family physicians for the recipients of public assistance, and to pay for such care out of public assistance funds. The Social Security Act does not now permit the Federal Government to match any expenses of this sort; the Federal Government shares only in cash grants to individuals.
>
> I recommend that the Social Security Act be amended to provide for the matching by the Federal Government, on the same basis as in the case of other public assistance costs, of expenses incurred by the State agencies, to provide medical care as suggested above. While a maximum should be fixed for such expenditures, these costs should not be taken into account in connection with the maximum applied to the regular grants for individual recipients. Such action has often been requested by State agencies.

GUARANTEEING HOSPITAL STAFF POSITIONS

Additional Michigan hospitals which, since February 12, 1942, have advised the MSMS Medical Preparedness Committee that the hospital staff positions in their institutions, now held by doctors entering the armed forces of the United States, will be retained upon the physicians' discharge from active military duty, include:

Detroit—Grace Hospital—John H. Law, M.D., Secretary Executive Committee—guaranteed.

—Providence Hospital—R. V. Walker, M.D., Chief of Staff—guaranteed.

—St. Mary's Hospital—Sister Ann, Superintendent—guaranteed.

Edmore—Edmore Hospital—M. G. Becker, M.D.,—guaranteed.

Kalamazoo—Bronson Methodist Hospital—Paul G. Schrier, M.D., Secretary of Staff—guaranteed.

Marquette—St. Luke's Hospital—O. I. Niemi, M.D., Secretary of Staff—guaranteed.

The first and second lists of hospitals which are guaranteeing staff positions were published in the February and March, MSMS JOURNALS.

Additional replies, as received from hospitals, will be published in the MSMS JOURNAL from month to month.

NEW EMERITUS AND RETIRED MEMBERS

The Michigan State Medical Society House of Delegates, at its 1941 meeting, bestowed Emeritus membership on the following Doctors of Medicine:

C. D. Aaron, M.D., Detroit.
Angus L. Cowan, M.D., Detroit.
Gilbert S. Field, M.D., Detroit.
George E. Frothingham, M.D., Detroit.
Fred J. Graham, M.D., Alma.
Wilber F. Hoyt, M.D., Paw Paw.
Abraham Leenhouts, M.D., Holland.
Wm. C. Martin, M.D., Detroit.
Irwin H. Neff, M.D., Detroit.
Walter R. Parker, M.D., Detroit.
G. L. Renaud, M.D., Detroit.
M. D. Ryan, M.D., Saginaw.
Joseph E. G. Waddington, M.D., Detroit.

According to the MSMS Constitution, Article Three, Section VI, an Emeritus Member is any physician who has been in practice for fifty years and who has maintained a membership in good standing in the MSMS for twenty-five years.

The House of Delegates also transferred the following physicians to Retired membership:

Charles W. Ash, M.D., Bay City.
H. S. Bartholomew, M.D., Lansing.
H. J. Hammond, M.D., Detroit.
E. G. McConnell, M.D., Lansing.
J. H. O'Dell, M.D., Three Rivers.
C. H. O'Neil, M.D., Flint.
C. V. Russell, M.D., Lansing.
C. M. Swantek, M.D., Bay City.

Retired members, according to Article Four, Section V of the MSMS Constitution, are members who have maintained their membership in a component county society for a period of ten or more years and who are certified by their Society as having retired from practice.

Communication

NEW APPOINTMENT PROCEDURE FOR PHYSICIANS AND DENTISTS

Federal Security Agency
U. S. Public Health Service
Washington

February 14, 1942.

To District Directors, Medical Officers in Charge and others concerned:

1. The Procurement and Assignment Service within the Office of Defense Health and Welfare Services has the responsibility for assisting in the procurement and assignment of *physicians and dentists* in such manner as to best serve the over-all health and medical needs of the country. It is essential that the personnel policy of the Public Health Service be consistent with the major purposes of the Procurement and Assignment Service.

2. It is desired that applications be solicited from qualified physicians and dentists for commission in the reserve corps of the U. S. Public Health Service. The expansion of the reserve corps of the Public Health Service is necessary to serve two major purposes:

(a) The creation of a pool of qualified public health personnel to safeguard essential civilian health services and at the same time to be available for immediate, though temporary, active duty in the event of some major public health emergency.

(b) The procurement of sufficient numbers of qualified physicians and dentists to enable the Public Health Service to carry on its normal and wartime activities.

3. In order to serve these two major purposes, it will be necessary to recruit into the reserve of the Public Health Service physicians and dentists who come within the two following categories:

(a) Those who are now engaged in public health work and who by reason of special training and experience occupy strategic positions in their present civilian capacities. Such personnel would be expected to remain on inactive status with the Public Health Service, except in the event of a major disaster, in which case they would be subject to immediate, though temporary, active duty.

(b) Those who are professionally qualified and also available for immediate active duty in the Public Health Service for such periods of time as the exigencies of the service may determine.

4. Applications from physicians and dentists relating to commissions in the reserve of the Public Health Service will be processed in the following manner: On receipt of an application by the office of the Surgeon General, the application forms and all supporting papers, including the report of physical examination, will be transmitted with a definite recommendation of the Surgeon General to the Procurement and Assignment Service. The Procurement and Assignment Service will in turn certify to the Surgeon General as to the availability of the individual for appointment. In the case of public health personnel occupying strategic positions in civilian posts, the criterion of availability for commission would rest largely upon the fact that the individual occupies a strategic position, and therefore should remain as long as practicable on an inactive status. In the case of personnel to be called to immediate active duty, the criterion of availability would be based upon the ability of the community to spare the services of the individual. Upon receipt from the Procurement and Assignment Service of notice of clearance, indicating that the applicant is available for a commission in the reserve of the Public Health Service, the appointment will be completed in the usual manner.

5. The above procedure does not apply to the recruiting of individuals for the regular corps of the Public Health Service, nor to the appointment of internes or doctors certified by the Civil Service Commission, nor to the appointment of sanitary engineer officers in the reserve.

6. When the Public Health Service is without acceptable applications from physicians and dentists for filling vacancies, the Surgeon General will request the Procurement and Assignment Service for the names and qualifications of persons available to fill such vacancies. When decision has been reached as to the selection or nonselection of such persons, the Surgeon General will advise the Procurement and Assignment Service.

7. The Procurement and Assignment Service has given its endorsement to the procedure outlined above.

THOMAS PARRAN, *Surgeon General.*

Approved:
PAUL V. MCNUTT, *Administrator.*

EXCLUDING TUBERCULOSIS FROM THE NAVY

Compactness of living spaces aboard a naval vessel is a necessity. Advances in ship construction from the standpoint of ventilation and sanitation in general have been made, but men living aboard are still somewhat crowded. Under such conditions an open case of tuberculosis is a real menace. Medical officers are on the alert, but the average sailor likes to think of himself as a rugged, hardy individual and will not, as a rule, report to the sick bay unless he really feels sick.

No applicant showing any degree of adult type tuberculosis is acceptable. Men in the service who develop tuberculosis are retired and are not subject to recall to active duty, even with long standing arrest and minimal lesions.—*Tuberculosis Abstracts,* March 1942.

JOUR. M.S.M.S.

EXPERT TESTIMONY AND FEES*

LEO M. FORD, LL.B., J. D.
Fort Wayne, Indiana

Out of all walks of life, the doctor is probably the person most frequently called upon to give expert testimony. Our modern industrialism has increased litigation involving personal injury, and many technical questions arise daily requiring the testimony of an expert. However, in this article, we are concerned chiefly with the position of the doctor who is called upon to testify in a malpractice suit, either for or against a fellow practitioner.

Opinion Evidence

In general, it is the function of a witness in court to state the facts within his personal knowledge, and a lay witness is not permitted to express opinions or conclusions. The expert witness is the exception to this rule, as he is called for the express purpose of giving his opinion or conclusion on the technical question involved. In a malpractice case, a doctor's special knowledge and experience enables him to accurately draw inferences and conclusions from the subject matter that is clearly beyond the realm of a layman. In fact, expert testimony is essential to the determination of the issues. This is proper inasmuch as the issue to be determined is whether or not the doctor exercised ordinary care and skill in the treatment in question.

Expert testimony has a dual purpose; to clarify the nature of the injury and the probable result therefrom; also to set up a standard of practice in the community by which the defendant is to be judged. The latter is the more important function of the expert witness in malpractice litigation. The whole subject is one requiring special knowledge and experience, based upon years of study and training. When one considers the years of preparation required for the modern physician, it shows how important it is that the rules governing proof in malpractice cases should be strictly enforced. It is unfortunate that, at the present time, there is a tendency in some of our courts to relax the rules of proof and permit laymen to testify to certain facts which a layman may observe, such as that the arm or leg was crooked following the reduction. These courts state that if the member was crooked following the reduction, it is apparent that it was not properly reduced; therefore, expert testimony is not required to prove malpractice.

Qualifications

It is within the sound discretion of the trial court to determine both the admissability of opinion evidence and the qualifications of the expert. Any licensed physician is considered to be qualified as an expert, regardless of his inexperience in the particular type of case at hand. Manifestly, more weight should attach to the opinion of an expert who has had actual and extensive experience in the particular matters at issue, but in some instances, doctors have been permitted to express an opinion on matters concerning which they have had absolutely no practice. The courts hold that if the doctor states that he is familiar with the proper treatment from study, then he qualifies as an expert in the field, regardless of the fact that he has had no experience whatever.

It is important to note that a doctor may be thoroughly qualified to express an opinion concerning the nature or type of a disease or injury and its probable result, and yet not be qualified to say what would be considered good practice or the exercise of ordinary care and skill in the community, if he does not practice in the community and is not, therefore, familiar with the standard of care and skill in the locality in question. The treatment of all forms of human ailments is not standardized. What may be accepted treatment in one community may not be the approved or accepted practice in another. A court very aptly stated this:

> To qualify as such expert in a malpractice case against a physician, the witness must not only show himself to possess learning and knowledge of the subject of inquiry sufficient to qualify him to speak with authority on the subject, but also a familiarity with treatment and degree of care and skill of other practitioners in the locality in question, sufficient to qualify him to say whether or not the defendant's treatment was consistent with what other physicians in the exercise of reasonable care might do under similar circumstances.

When an expert appears for the plaintiff, it is altogether proper for the defense counsel to

*This article is Part III in a series of authoritative discussions on Medico-legal problems written by Mr. Ford, Attorney for the Medical Protective Company, Fort Wayne, Indiana.

ask permission of the court to cross-examine the witness as to his qualifications and interrogate the witness with respect to his knowledge of similar cases and inquire as to the names of other doctors with whom the witness has discussed a case of similar facts respecting their methods of treatment. A doctor may be recognized in the profession as a leading authority on the treatment of a certain type of disease and yet not be qualified to testify as to the method of treatment usually followed by the doctors in any particular community. The defendant is not to be judged by what some other doctor would do under the same or similar circumstances, but by the treatment followed by the average physician in the same or similar localities. The physician's duty is to render the ordinary care and skill of the average practitioner, and the standard by which he should be judged is determined by the standard or methods accepted and used by his colleagues in his community. Thus, it is unimportant that the witness testify as to what his own method of treating a similar case would be.

Duty to Testify; Fees

A physician, like any other citizen, is obliged to answer a subpoena to testify in court. A physician, when summoned, may be called as an ordinary fact witness, that is he may be summoned to testify to something which has nothing to do with his profession, and thus he testifies not as an expert. If, however, he testifies on the subject of medicine or surgery or answers a hypothetical question propounded to him, then he is testifying as an expert. On the basis of upholding constitutional government and the administration of justice, it is held that all members of society are under the public duty of attending court and giving testimony when summoned by due process of law. Under present-day statutes, some fee is granted, plus an allowance for mileage for any witness summoned to testify in court. It does not follow, however, that a private litigant has a right to subpoena a physician to give expert testimony without receiving an expert fee. Some of our courts follow the English rule and hold that a physician giving expert testimony is entitled to additional compensation on the ground that an expert's scientific knowledge is his capital stock, his means of livelihood, and his property which should not be taken from him without just compensation. Other courts have denied special compensation to experts for testifying as to opinions formed or answering hypothetical questions, when no extra work was required to formulate the opinion, on the ground that it is the duty of all citizens to aid the law to their utmost ability.

A physician is obliged to answer all questions asked him, if so directed by the court. If a doctor is summoned by a plaintiff in a malpractice case, it seems perfectly proper that he should refuse to give expert testimony unless he receives an expert fee therefore and then be guided by the ruling of the court.

It is contrary to public policy for an expert witness to enter into a contract for fees contingent upon the outcome of the suit. The result of such an agreement is to ascribe to the witness a bias which destroys the value of his testimony and is naturally inimical to the administration of justice. The testimony of experts in cases other than malpractice has caused the law to look with ill favor upon opinion evidence. This is due to the fact that such testimony is usually available at a price, thus weakening or destroying its effectiveness. The profession of Michigan, recognizing that the effectiveness of expert testimony in malpractice cases is weakened if a charge is made, passed the following resolution:

> We recommend that no reimbursements be made to members giving testimony in behalf of other members, and are of the opinion that such service should be rendered as a matter of professional courtesy.—THE JOURNAL MSMS, Feb. 1933, p. 137.

A doctor thus testifying in behalf of a colleague in a malpractice case can answer, on cross-examination, that he is not being paid an expert witness fee. Such testimony, therefore, carries much greater weight with the jury.

Furthermore, there is a statute in the State of Michigan which provides:

> Compiled Laws Michigan, 1929, Section 14223. Expert witnesses: fees: contempt for excess fees. Sec. 69.
>
> No expert witness shall be paid, or receive as compensation in any given case for his services as such, a sum in excess of the ordinary witness fees provided by law, unless the court before whom such witness is to appear, or has appeared, awards a larger amount than such award, and any person who shall pay such witness a larger sum than such award, shall be guilty of contempt of court, and on conviction thereof be punished accordingly.

Where the defense of a malpractice case is deserving, it is customary for the doctors to thus

assist their colleague by testifying without remuneration.

Defense Experts

To exert the greatest influence, the expert for the defense of a malpractice case should be positive and forceful. The issue is whether or not the defendant exercised the degree of care and skill usually possessed and exercised by the other doctors in the locality in question. The witness should remember that there are various methods of reaching the end result, and if he can honestly say that the method pursued by the defendant is a method recognized by his colleagues as an accepted method of treatment, it is the expert's duty to so state forcibly and unequivocally. The expert witness, though expressing a willingness to aid the defendant, but desiring to impress upon the court and jury that he himself might have produced a little better result by altering the treatment in a few details is not an effective witness. This type of hedging lays the witness open to a cross-examination which destroys the effectiveness of his testimony. This point is emphasized by the following quotation from the opinion of the Supreme Court of Utah:

> However, the real controversy between the parties arises over expert testimony offered by plaintiff to the effect that iodine is not a disinfectant; that cultures should have been taken as an initial step in the treatment; that scrubbing with a stiff brush was injurious and not beneficial to the wound; that the leg should have been exposed to the air in order to kill the gas bacilli; and that, in the opinion of the expert offered by plaintiff, Dr. Shields' treatment was improper. This evidence was rejected by the court.
>
> In a case such as this confusion often arises over a failure to distinguish between the expert's opinion as to the proper method of treatment and his opinion as to whether or not the treatment applied conforms to what is generally accepted to be the proper method. The practice of medicine or of surgery has not become so standardized that it is unreasonable for two doctors to have different opinions as to the proper method of treating injuries. If, then, there is reason for the existence of that difference, neither opinion can be proven erroneous by offering as proof thereof merely the other. It does not fall upon the shoulders of the judge or jury to determine whether or not there is a good and sufficient reason for the existence of such a difference; that reason is assumed to be valid when it appears from the evidence that the divisions of opinion are such that it cannot be said of any one opinion that it is generally accepted to be the right one. Consider for the moment the controversy over iodine in the case. Counsel for plaintiff presented an extract from the work of one Dean Lewis which is very emphatic in stating that iodine is worthless as an antiseptic. We have no reason to doubt the sincerity of Dean Lewis, nor, for that matter, the sincerity of plaintiff's expert who would probably testify to the same effect. Dr. Lewis is very convincing with his reference to millions of failures during the World War and the many successes with another form of treatment, but who are we to come forward and say: Yes, Dean Lewis is right, the others are wrong; and Dr. Shields, though he may have done as the others would have done, did not do as Dean Lewis would have done, therefore, he is liable. The mere statement of such a proposition sufficiently emphasizes its fallacy. Dr. Lewis himself shows that there is a difference of opinion as to the propriety of using iodine. He deplores the fact that many doctors "with the blind faith of their forefathers" continue its use. It is quite evident that these "blind" practitioners do not agree with the author. It may be that their only reason for not agreeing with him is "blind faith," but we as laymen do not know what it is. We are not qualified to say that a difference should or should not exist between them. We must rely upon the doctors themselves to dispose of that controversy. When they have concluded that Dr. Lewis is right and the others wrong, then we shall reach the same conclusion. Some of their number may never reach that conclusion, but it is more than likely that, if Dean Lewis is right in his contentions, it will not be long before a sufficient number of the doctors will agree with him and thus constitute his views the generally accepted views upon the subject of iodine; and therefore right in so far as the law is concerned.

It is, therefore, the duty of the expert for the defense to look into the subject from a broad point of view; and when such witness is convinced that the defendant treated the case with that degree of care and skill required by law, he should testify whole-heartedly that in his opinion the treatment of the defendant fully met the legal requirements of good practice.

It would be very helpful if each local society would form a defense committee charged with the duty of scrutinizing the expert testimony given in any malpractice case. They are the ones who can best determine whether such testimony is given honestly and without perjury. The society should stand ready to furnish expert testimony for the defense of any unmerited malpractice case, at no cost to the defendant, after a full investigation of the facts and the development of an honest opinion. Malpractice suits differ greatly from other types of personal injury cases where expert testimony is not required to determine the question of liability. Honesty on the part of the expert witness is a primary requisite; honesty to the patient, to his colleagues, and to himself.

INFANT MORTALITY AT NEW LOW

Michigan's infant mortality rate in 1941 dropped to 38.9 for an all-time record. This was the first time in the state's history that fewer than 40 babies out of every 1,000 live births died in their first year. In 1940 the infant mortality rate was 40.7.

Coupled with the new low mortality rate was a new high in the number of live births in Michigan last year. Department records show that 107,618 babies were born alive in 1941. Compared with the previous record of 99,940 births in 1927, the total was higher by more than 7,500 births.

The number of deaths last year among babies in their first year of life was 4,182. In 1940 the total was 4,022.

IMMUNIZING CAMPAIGN

Detroit and Wayne county are the starting points of Michigan's emergency immunization campaign to protect children over nine months and under ten years of age against diphtheria and smallpox.

Other defense areas will be next in the program which is expected to cover the entire state by May 1, Child Health Day.

The State Health Department is urging parents to take all unprotected children to their physicians immediately. The toxoid and vaccine used in the immunizations is that produced and distributed by the Department laboratories.

MEXICAN FIELD WORKERS

Before work begins in the state's sugar beet fields, this year, the State Health Department expects to supervise again the health examination in Texas of 12,000 prospective Mexican field laborers.

These annual health examinations were begun in 1937 when it was found that there were many more Mexicans receiving sanatorium care at public expense for tuberculosis than would have been expected from their numbers in the population. The preëmployment examinations in Texas with a fluoroscope have screened out persons having tuberculosis. Out of 17,600 Mexicans who went through the examining center in San Antonio in three years, 400 were rejected because they had tuberculosis.

In order to examine as many workers as will be needed in Michigan sugar beet fields this year, a center at Dallas will be added to the one at San Antonio. Coöperating in the examinations are the Michigan Beet Growers Association, the Texas State Health Department, the health departments of Dallas and San Antonio and the Michigan Department of Health.

SCARLET FEVER LEADS

Scarlet fever is now Michigan's No. 1 communicable disease. From January 1 through March 6, 2,484 cases were reported to the State Health Department. Whooping cough with 2,178 cases is in second place followed by measles with 1,537 and lobar pneumonia with 683.

Cases of other communicable diseases reported to the Department for the same period were: diphtheria 46, streptococcic sore throat 41, poliomyelitis 7, typhoid fever 1, and rheumatic fever 1.

RESULTS OF HEALTH EXAMINATIONS ANNOUNCED

Eighty-five per cent of the 422 new full-time students who were examined upon entrance at Wayne University in February were given "Class A" ratings in physical examinations recently completed, according to Dr. Irvin W. Sander, director of the Student Health Service. Such rating makes possible unrestricted participation in health-education activities; a lower rating calls for a milder schedule of exercise.

Twelve per cent of the students examined showed no evidence of physical defects. Commonest impairments involved teeth, vision, the nose and throat, hearing, the circulatory system, and the kidneys. Students affected were referred to their family physicians or dentists for care.

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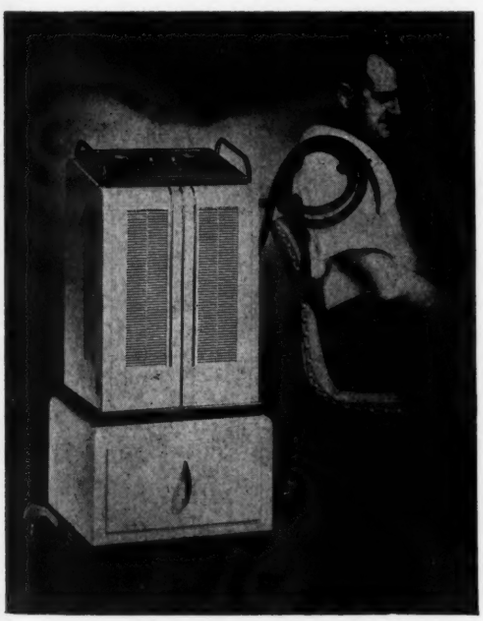

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✶ COUNTY AND PERSONAL ACTIVITIES ✶

100 Per Cent Club for 1942

Ingham—R. J. Himmelberger, M.D., Secretary.
Menominee—W. S. Jones, M.D., Secretary.
Midland—H. H. Gay, M.D., Secretary.
Muskegon—Thomas J. Kane, M.D., Secretary.
Oceana—V. W. Jensen, M.D., Secretary.
Sanilac—E. W. Blanchard, M.D., Secretary.
Tuscola—F. J. Gugino, M.D., Secretary.

The above County Medical Societies have certified 1942 dues for every member of their respective societies to be among the first 100 per cent paid up counties for 1942. Unpaid members are delinquent as of April 1, 1942, and should see their respective county medical society secretary at once in order to insure that their membership does not lapse.

H. C. Hill, M.D., Howell, addressed the Sanilac County Medical Society at Sandusky, March 19, on the subject of "Medical Preparedness."

Major C. I. Owen, Lansing, addressed the annual meeting of the Staff of St. Mary's Hospital, Grand Rapids, recently.

* * *

Fred R. Reed, M.D., Three Rivers, spoke to the Public Health Officers of southwestern Michigan in Kalamazoo on March 13.

* * *

Henry J. Vanden Berg, M.D., Grand Rapids, addressed the Women's Club of Caledonia on "Cancer Control," on February 19.

* * *

H. S. Collisi, M.D., Chairman of the MSMS Public Relations Committee, Grand Rapids, addressed the Tri-County Medical Society at Hart on February 19 on "Medical Preparedness."

* * *

In the First World War, the total number of doctors of medicine who were mustered was approximately 30,000. Of the medical officers enrolled, 98.3 per cent were called from civilian ranks.

* * *

C. G. Clippert, M.D., Grayling, appeared before the Bay County Medical Society on March 25; before the Alpena County Medical Society on March 26, and is scheduled to address the Saginaw County Medical Society on April 21.

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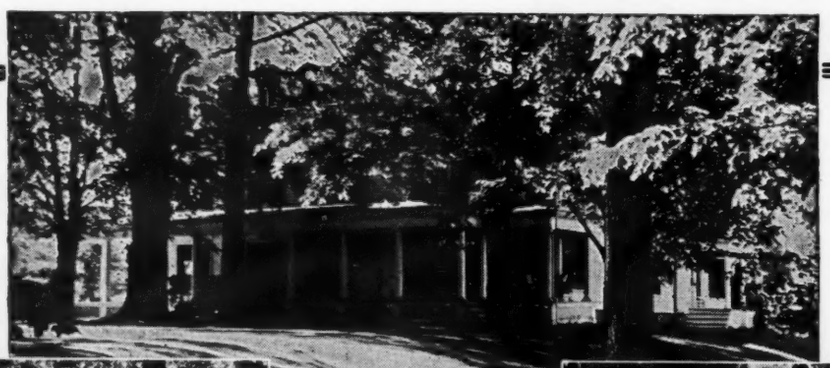

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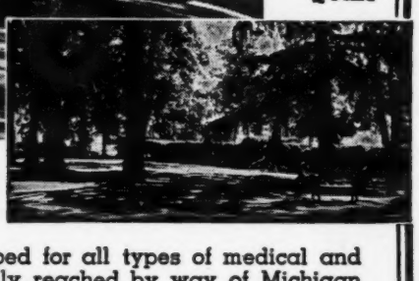

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The Bulletin cover of the Ingham County Medical Society has been changed and now carries photographs of prominent local institutions. Among the photographs carried thus far have been the Capitol building, St. Lawrence and Edward W. Sparrow Hospitals.

* * *

M. J. Holdsworth, M.D., Grand Rapids, has been selected as the Golf Chairman for the 1942 MSMS Annual Convention. Blythefield Country Club has been chosen for the Sixth Annual Tournament which will be held on Monday, September 21, 1942.

* * *

Procurement and Assignment enrollment forms were to have been mailed to every physician in the United States about April 1, 1942. Physicians are urgently requested by P. R. Urmston, M.D., Chairman of the Procurement and Assignment Committe for Michigan, to immediately fill out the questionnaire and enrollment form and return it without delay, thus signifying their desire to serve their country in this time of emergency whether at home or with the armed forces.

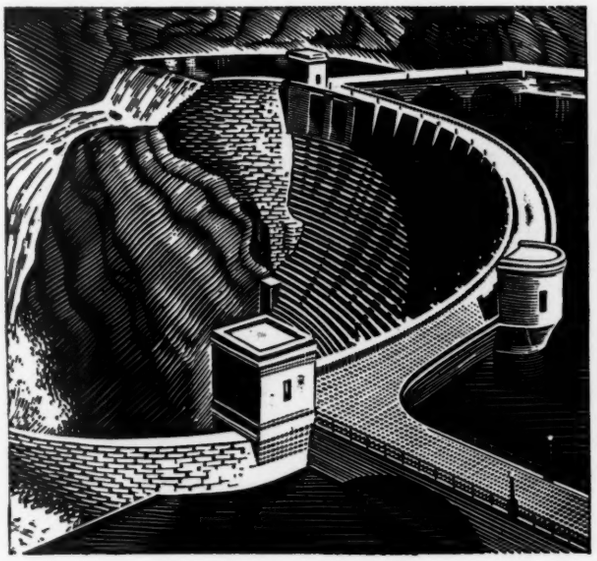
* * *

The Northern Tri-State Medical Association held its Sixty-ninth Annual Meeting at Fort Wayne, Indiana, on April 7, 1942. Among the guest speakers were Nicholas Eastman, M.D., Baltimore, Maryland; Jonathan Forman, M.D., Columbus, Ohio; William S. Keller, M.D., Columbus, Ohio; Paul B. Magnuson, M.D., Chicago, Illinois; Beveridge H. Moore, M.D., Chicago, Illinois; Irvine H. Page, M.D., Indianapolis, Indiana; Arthur H. Parmalee, M.D., Chicago, Illinois; Paul Starr, M.D., Chicago, Illinois; Clair L. Straith, M.D., Detroit, Michigan, and Frederick Yonkman, M.D., Detroit, Michigan.

* * *

H. Allen Moyer, M.D., State Commissioner of Health, appointed the following committee to study the needs for the control of communicable disease which have arisen due to the sudden influx of defense workers in certain areas of the state, particularly where no organized health department exists: Frank Van Schoick, M.D., Jackson, representing the Michigan State Medical Society; E. V. Thiehoff, M.D., Lansing, representing the Michigan Department of Health; Edgar Martmer, M.D., Detroit, representing the Michigan Branch, American Academy of Pediatrics; Mrs. Lena Schermann, R.N., Mason, representing the Michigan State Nurses Association, and Mr. G. Robert Koopman, Lansing, representing the Michigan Department of Public Instruction.

The Committee was appointed pursuant to a recommendation made by the Child Welfare Committee and approved by The Council of the Michigan State Medical Society.



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Marion, Ohio

Physicians are again urged to save containers and vials in which they receive biologicals, including the rubber stoppers and bulbs, and return them promptly to the State Health Laboratories, Lansing, Michigan.

The Michigan Association of Industrial Physicians and Surgeons held its 1942 Annual Meeting in Flint, on April 1. Among those on the program were: Henry H. Kessler, M.D., Newark, New Jersey; A. H. Whittaker, M.D., Detroit; Kenneth E. Markuson, M.D., Lansing; Harold H. Gay, M.D., Midland; C. W. Muehlberger, Ph.D., Lansing; Max Burnell, M.D., Flint; Grover C. Penberthy, M.D., Detroit; John B. Hartzell, M.D., Detroit; Capt. N. K. Jensen, M.C., U. S. Army, Camp Crowder, Missouri, and Jackson Livesay, M.D., Flint. Following the Annual Banquet, Clay Ray Murray, M.D., New York, spoke on "The Operative Treatment of Fractures." Another feature of the meeting was the fracture exhibit sponsored by the Department of Traumatic Surgery, Hurley Hospital, Flint.

* * *

Your Friends

M and R Dietetic Laboratories, Inc., Columbus, Ohio.
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The Wm. S. Merrell Company, Cincinnati, Ohio.
Michigan Medical and Michigan Hospital Service, Detroit.
The C. V. Mosby Company, St. Louis, Missouri.

The above ten firms were exhibitors at the 1941 Convention of the Michigan State Medical Society and helped make possible for your enjoyment one of the outstanding state medical meetings in the country. Remember *your friends* when you have need of equipment, medical supplies, appliances or service.

* * *

Nearly 1,100 physicians from all corners of the State of Michigan came to Detroit on March 10 to hear a discussion of Procurement and Assignment. Charles H. Phifer, M.D., Chicago, Chairman of the Sixth Corps Area Committee on P. & A., and Dr. G. D. Timmons of Chicago. Captain Fred R. Hook, of the U. S. Navy Medical Corps, and Major Roger Prentiss, of the U. S. Army Medical Corps, Washington, D. C., outlined the needs of their respective organizations for medical personnel. John S. Coulter, M.D., Chicago, Regional Medical Officer, Office of Civilian Defense, discussed the organizational setup of civilian defense, particularly the organization of emergency medical service.

Say you saw it in the Journal of the Michigan State Medical Society

Despite the hazardous road conditions, physicians were present from practically all of the counties of the Lower Peninsula and some from the Upper Peninsula made the long trip.

The Annual Spring Clinic of the Ingham County Medical Society will be held at the Hotel Olds, Lansing, Michigan, on Thursday, May 7, 1942, from 11:00 a. m. through the afternoon and evening. The program will include a symposium of rheumatic fever, papers on surgery, gynecology and therapeutics and war medicine. Among the speakers will be Stanley Gibson, M.D., of Chicago, pediatrician; Richard B. Cattell, M.D., of Lahey Clinic, Boston, surgeon; Virgil Simpson, M.D., of Louisville, Kentucky, internist, and Norman Miller, M.D., Professor of Obstetrics and Gynecology, Ann Arbor, Michigan.

The program will include luncheon and evening dinner. All physicians are invited.

THE WAYNE UNIVERSITY COLLEGE OF MEDICINE ANNUAL ALUMNI CLINIC DAY

Horace H. Rackham Educational Memorial Building
Detroit, Michigan

May 6, 1942

Morning Session, 9:00 a.m.

Registration

"Proven Preparations in Endocrine Therapy and Their Application."—Elmer L. Sevringhaus, M.D., Professor of Medicine, University of Wisconsin Medical College

"The Present Status of the Surgical Treatment of Hypertension."—Alfred W. Adson, M.D., Neurological Surgeon, Mayo Clinic

Business Meeting of the Alumni Association

Noon Luncheon, 12:00 m.

Complimentary Luncheon

Afternoon Session, 1:10 p.m.

"X-ray Treatment of Lesions of the Face."—John Murphy, M.D., Roentgenologist, St. Vincent's Hospital, Toledo, Ohio

"The Recognition and Management of Acute Injuries to the Chest."—George Curtis, M.D., Professor of Surgery, Ohio State University.

"The Diagnosis of Splenic Enlargements."—Plinn F. Morse, M.D., Pathologist—Harper Hospital, Detroit, Michigan

Evening Banquet, 7:00 p.m.

Horace H. Rackham Educational Memorial Building
For Alumni and their Wives

Speaker: Preston Slosson—Professor of European History, University of Michigan, and Popular Radio Commentator. "Making the World Safe for Democracy—Can We Do It This Time?"

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This advertisement is printed by the wine growers of California acting through the Wine Advisory Board, 85 Second Street, San Francisco. The nonprofit Wine Advisory Board invites your requests for further information about California wines.

IN MEMORIAM

Byron E. Burnell of Flint, was born in the year 1867 and was graduated from the Detroit College of Medicine in 1901. He immediately began his practice in Flint. He was past-president and an honorary member of the Genesee County Medical Society and many civic organizations. Dr. Burnell died at Hurley Hospital on February 16, after a prolonged illness which had confined him to the hospital since December 25.

F. J. Graham of Alma, was born at Cooksville, Ontario, April 17, 1856, and was graduated from the University of Michigan Medical School in 1891. The year of his graduation, Dr. Graham located in Sumner and practiced there, with the exception of three years spent in the West, until 1917, when he moved to Alma. His son, Dr. Bernard Graham, entered partnership with his father in 1932. Dr. Graham retired from active practice in 1939. He was elected to Emeritus Membership in the Michigan State Medical Society in 1941. Dr. Graham died in New Orleans on March 8, 1942.

Writes on Adolescence

"Adolescent Changes as a Factor in Delinquency," an article by Prof. Fritz Redl of Wayne University, has been issued in reprint form following its appearance in the 1941 yearbook of the National Probation Association.—*Wayne University Newsletter.*

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THE DOCTOR'S LIBRARY

Acknowledgment of all books received will be made in this column and this will be deemed by us as a full compensation of those sending them. A selection will be made for review, as expedient.

SYNOPSIS OF GENITO-URINARY DISEASES. By Austin I. Dodson, M.D., F.A.C.S., Richmond, Virginia. Professor of Genito-urinary Surgery, Medical College of Virginia; Genito-urinary Surgeon to the Hospital Division, Medical College of Virginia; Genito-urinary Surgeon to Crippled Children's Hospital; Urologist to St. Elizabeth's Hospital; Urologist to St. Luke's Hospital and McGuire Clinic. Third Edition, with 112 illustrations. St. Louis: The C. V. Mosby Company, 1941. Price: $3.50.

This is the third edition of the synopsis first published by Mosby in 1934. In this revision the new chemotherapeutic agents are extensively discussed and explained. Other changes have been made to clarify the subject.

IMMUNOLOGY. By Nobel Pierce Sherwood, Ph.D., M.D., F.A.C.P., Professor of Bacteriology, University of Kansas, and Pathologist to the Lawrence Memorial Hospital, Lawrence, Kansas. Second Edition. Illustrated. St. Louis: The C. V. Mosby Company, 1941. Price: $6.50.

This is the second edition, first published in 1935. In order to bring the subject matter up to date the chapters have been re-arranged, some material deleted, and new chapters added; one of them, "The Reticulo-Endothelial System," and one on "Serum Reaction." The material is simplified to make it more comprehensible. Many colored plates are used and the discussion is complete with an extensive bibliography. The typography is excellent. It is recommended to the advanced student.

THE 1941 YEAR BOOK OF PATHOLOGY AND IMMUNOLOGY. Edited by Howard T. Karsner, M.D., Professor of Pathology, Director of the Institute of Pathology, Western Reserve University, Cleveland; and Sanford B. Hooker, A.M., M.D., Professor of Immunology, Boston University School of Medicine; Member, Evans Memorial for Clinical Research and Preventive Medicine; Immunologist, Massachusetts Memorial Hospitals. Chicago: The Year Book Publishers, 1941. Price $3.00.

The well-chosen illustrations make the abstracts of the pathological section of this year's book a valuable reference for the progressive physician. The discussion of immunology brings up to date the newer findings in this still undeveloped field. The editorial comment and the classification simplify the absorption of this complicated field.

THE 1941 YEAR BOOK OF INDUSTRIAL AND ORTHOPEDIC SURGERY. Edited by Charles F. Painter, M.D., Orthopedic Surgeon to the Massachusetts Women's Hospital and Beth Israel Hospital, Boston. Chicago: The Year Book Publishers, Inc., 1941. Price: $3.00.

Emphasis, in this year's volume, is laid upon the newer type of operations on the bones and joints. Five-sixths of the volume is confined to orthopedic surgery and only one-sixth to that great increasing field of industrial surgery and medicine. This seems out of proportion. The abstracts are exceptionally well chosen and well done.

SURGICAL PRACTICE OF THE LAHEY CLINIC. Boston, Massachusetts. 376 illustrations. Philadelphia: W. B. Saunders Company, 1941. Price: $10.00.

This represents a cross-section of the Lahey Clinic work as practiced today; its methods, techniques, diagnostic measures, and results. The methods represent an attempt at such standardization as will permit

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each surgeon to perform each surgical procedure largely in the same way which, Frank Lahey believes, will bring the best results with the lowest mortality. It is excellently written and illustrated. The typography is good and it is well organized. It is recommended for every general surgeon.

THE MEDICAL CLINICS OF NORTH AMERICA. November, 1941. Vol. 25; No. 6. Military Medicine. Philadelphia: W. B. Saunders Company, 1941. Price: Cloth $16.00 per Clinic Year; Paper $12.00 per Clinic Year.

Nearly every phase of medicine applicable to military service is covered by an authority on that particular specialty. Lessons learned in the first World War are brought to mind and information gained from European sources in the present war is presented. The volume is recommended as part of our preparedness program. The typography is good and the organization well done.

Reading Notices

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SPECIAL CARE OF BABIES IN EVENT OF AIR RAIDS

Instructions as to the special care of babies in the event of an air raid, based in part on the experience of London and other English cities, were made public today by the American Committee on Maternal Welfare.

In view of the general possibility of air raids on American cities, particularly in the coastal zones, the committee regards it as important that American mothers understand and prepare well in advance for the task of protecting their babies. The committee is composed of the leading medical, public health, nursing and hospital organizations of the country and can thus speak with authority.

Aside from the immediate need of shelter from bomb explosions, the most important fact to keep in mind, the English have learned, is that the mother's mental attitude is baby's best guarantee against air raids.

"However frightened you may feel," the committee quoted from instructions issued by the British National Baby Welfare Council, "keep outwardly calm and unflurried, so that the child's confidence in your own protectiveness may not be shaken.

"Never speak of the raid in the child's hearing if you can avoid it. Mental impressions are formed very much earlier than most people realize. Many of the problem cases among grownups of the present day owe their condition to their parents having talked continually in the presence of the children about past and future air raids, about their own terror, and the effect of this on the child. The following words are as true today as when they were written thousands of years ago: 'In quietness and confidence shall be your strength.'"

When the raid signal sounds, the first move should be in the direction of the nearest shelter. If there is no shelter, take the baby to the safest room in the house, or to a closet under the stairs or under a table or bed, so that he may be protected from flying debris, which presents the most frequent danger.

Take with him garments enough to keep him warm according to the season; a basket or pillow on which he can lie; a first-aid outfit in case of need; a toy to amuse him; his bottle of milk and bottle of water, together with extra diapers and related equipment.

The baby's ears should be blocked with cotton wool to minimize the effects of concussion, leaving plenty outside so that it may be easily withdrawn afterward.

If the raid should come while the baby is away from either house or shelter—for an airing in the park, for instance—find the nearest wall or ditch, however low, place the baby on the ground beside it, with pillows from the baby carriage or a heavy coat under and over him, and lie down beside him.

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NOTES ON THE APPENDIX VERMIFORMIS: ANATOMICAL AND CLINICAL*

GEORGE DOCK, M.D.
Ann Arbor, Michigan

(Continued from April, 1942 issue)

Occlusion of Appendix

This was found in the body of a man of seventy-two, dying of phthisis of many years' duration. The patient had been under the care of Dr. Breakey for a long time, more recently under that of Dr. Wessinger. No history of appendix disease was known.

The appendix was two inches long, hanging down into the pelvis. The proximal half was converted into an impervious cord not quite one-eighth inch thick. The distal end was slightly thicker, but not dilated; the coats fibrous-looking.

This shows eight cases, or 10 per centum of appendices, with marked evidences of disease, or abnormal contents. It would be much more valuable if we could know the histories of the cases, and it is to be hoped that in future a more careful search for the remains of disease in those who recover from appendicitis will be made.

These cases may be used in statistics in connection with others, and it is hoped their publication will serve a purpose.

The following cases are reported as additions to the natural history of appendix disease:

Recurring Appendix Disease Mistaken for Osteo-Sarcoma

Correct diagnosis at second attack; operation; recovery; death three months later from obstruction of intestines.

The patient, J. Sch., aet. 40, came under my care in September, 1890, while temporarily in charge of the surgical wards of a colleague. The patient was admitted for retention of urine, to which he was subject as the result of old stricture of urethra. On rectal examination, the prostate was found enlarged especially on the right side. The stricture was not very tight. Under the use of alkalies, with catheterization, the symptoms were soon relieved. About this time a swelling appeared in the right inguinal region. It was first discovered deep down, just beneath the middle of Poupart's ligament, being found during catheterization, though there was no evidence of it by the rectum. Gradually the swelling became more superficial, and finally redness of the skin and slight softening appeared.

There were no constitutional symptoms, other than those, already much milder, which accompanied the retention. The patient said he had had a similar attack a year before and recovered spontaneously. As the swelling had no connection with the prostate, I concluded it must be of appendicular origin. At that time my colleague returned, and as soon as he saw the patient said he remembered him well, and that he had a sarcoma of the pelvis. On expressing my surprise, he showed the case book, by which it appeared that, a year before, the man had been admitted in a similar condition. A consultation was then held, the man examined under chloroform, a diagnosis of osteo-sarcoma made, and the patient discharged, an operation being considered inadvisable. The swelling soon disappeared, leaving no trace the patient could discover.

An examination soon made it clear to my colleague that the mass we had then to deal with contained fluid. Under chloroform, an incision was made parallel to, and just above, Poupart's ligament, and a large quantity of fæcal-stinking pus and tissue debris evacuated. The cavity was separated from that of the abdomen by a firm wall, apparently more than half an inch thick. The whole cavity was lined by granulation tissue. There was no fæcal matter in the pus, and though the suspicion of appendix disease was greatly strengthened it was considered better not to explore for it at that time.

(Continued on Page 352)

*Presented at the Twenty-Seventh Annual Meeting of the Michigan State Medical Society held in Flint, May, 1892.

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(Continued from Page 350)

The cavity was washed out and packed and in a few days healed up and the man was discharged.

Three months later, December 26, 1890, the patient was admitted, late at night, to the Sealy Hospital. The patient was almost in collapse, with evidences of peritonitis and history pointing to obstruction of the intestines for four days. Dr. Hadra made abdominal section and found general peritonitis, with a small quantity of pus in the recto-vesical space and pus and fibrin flakes between the coils of intestines. The cause of the obstruction was a long tense omental band, adherent to the anterior abdominal wall, low down on the right side, with a number of loops of small intestine tightly caught and turned sharply over it. There were several adhesions between loops of intestines. The band was cut off short and ligated, the adhesions loosened, and the abdominal cavity thoroughly flushed out with hot water. The appendix was looked for but could not be found. The abdomen was closed. No one at the operation knew the patient's previous history, and the patient himself was unable to give it. Four hours after the operation the patient died.

Next morning, I was called in to make the autopsy and at once recognized the man. The scar of the old operation was quite narrow and pale. The peritoneum showed traces of severe inflammation everywhere. Four feet of ileum just above the valve were almost black, swollen, the mucous membrane thick and gelatinous. The cæcum was in the usual position, but fastened down to the end by firm adhesions so smooth that it seemed as if the cæcum was not entirely surrounded by peritoneum. The appendix could not be found at first, but on raising up the cæcum and breaking the new formed covering, it was found lying close to the iliac vessels and ending at the right pubic spine, to the connective tissue behind which it was adherent and could be separated with difficulty. The whole appendix was covered with a layer so smooth as to make it seem as though the organ was behind the peritoneum. This was all the more confusing from the general peritonitis which marked the opacity of the investment. The walls of the appendix were thick and rigid. The tip was curled downwards for half an inch beyond the adhesion to the pubis, and at the extreme end was a fine opening, through which a thin whitish fluid could be pressed. The opening was beneath the peritoneum and led into a fine sinus which could be traced down to the bottom of the pelvis. The peritoneum on the lower pelvic wall, from the crest of the pubis to the bottom, was thick and closely adherent to the dense cicatricial connective tissue which indicated the site of the abscess opened three months before. The bladder was adherent to the pelvic peritoneum on the right side, and to the rectum by old adhesions. The prostate was examined to see if the abscess had any connection with it, with negative results. It showed cicatricial remains in both lateral lobes, especially the right. There was a stricture of large calibre in the middle of the penile part of the urethra and another in the membranous part.

The appendix was empty, save a small quantity of thin, whitish fluid. Its walls presented an appearance much resembling that in the case of mucous plug, indicating inflammation affecting all the coats. The other organs in the body presented no changes bearing on the case.

This seemed to be a peculiarly instructive case of recurring appendicitis. The fatal end was of course an indirect one, from the adherent omentum, yet it cannot be doubted that the patient was constantly threatened with general peritonitis originating from the appendix. An operation in a period of quiescence, with removal of the appendix and search for and removal of omental adhesions, which should always be suspected, might have entirely prevented further trouble.

The next case was one with more familiar features, but presents interesting diagnostic and therapeutic aspects.

Began as a case of catarrhal enteritis, with mucous and slightly bloody stools, following the eating of a large quantity of grapes. Under treatment this improved, but became worse again and vomiting began. Soon after this, I first saw the patient. She had vomited everything swallowed for some hours, iced champagne included. The patient moved freely about the bed, the mind was clear and cheerful; face slightly flushed, temperature 101°. The patient complained only of vomiting, and pain in the left side under the false ribs. The abdomen was soft, not distended. Pressure was well borne everywhere except just over the position of the lower end of the spleen,

(Continued on Page 354)

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(Continued from Page 352)

and in the epigastrium; there was no increased resistance at any point. The tongue was red, the papillae enlarged. There had been no stool for about twelve hours.

Appendicitis had been suspected from the beginning, but there seemed not sufficient evidence of it. The vomiting impressed me as that of peritonitis. Small doses of calomel were given. The vomiting ceased and the patient slept well. In the following morning the vomiting began again, the temperature rose to 102.8°, higher than it had been at any time before. About noon the patient complained of sudden pain below the umbilicus, the temperature fell, the extremities became cool, and the patient went rapidly into collapse, with delirium, and died three hours later.

At the autopsy, was found general peritonitis, with about half a pint of thin, whitish pus and fibrin flakes between the coils of intestine.

The appendix lay along the brim of the pelvis, its serous covering red and with a patch of firm fibrin over the distal end.

The cæcum was normal. About a foot above the valve the adjacent surfaces of a loop of ileum were found adherent. On separting this, a necrotic area, almost black, about the size of a dime, was found. The colon just below the splenic flexure showed a similar spot, corresponding to another on the surface of the small intestine lying in contact with it. In these places, as in the rest of the small and large intestines, the mucous membrane was intact. Examining the appendix from the outside, without removing the fibrin flake, one would not suspect serious lesion. The orifice was platulous. On cutting the appendix open, a small transverse whitish slough in the mucous membrane was found near the end, and in the bottom of the slough, covered on the outside by the fibrin, though not tightly, was a perforation the size of a small pin's head.

Without an autopsy it might have been supposed that this was a case of peritonitis due to infection through a diseased, but not perforated, gut wall. That the perforation in the appendix was the point of exit can, however, not be doubted, and though remarkable for the absence of some of the commonest symptoms of appendicitis, the case is not unique. I am quite certain that in another case, almost precisely like the one described, the conditions were the same, but neither operation nor autopsy could be obtained, so that the supposition could not be confirmed.

Cases of this kind, with sudden alarming symptoms, raise the question whether it is not our duty to operate. Without this the issue is hopeless, and although in most cases, by the time an operation could be made, the collapse is so great as to make all efforts futile, there is reason to believe that operations by experienced surgeons would occasionally save life.

Peritonitis from Ligation of the Appendix

The common practice of ligating the appendix has always seemed to me wrong in theory, and an observation not included among the first eighty cases hardens me in that belief.

The idea seems to be that, when the appendix is ligated, and the end beyond the ligature cauterized or otherwise sterilized, the stump will cicatrize and the end either come away and be absorbed or its nutrition will be kept up by new-formed vessels from the proximal part. No doubt if the mucous membrane were separated perfectly, as the inner coats of the artery were supposed to be in ligation, or if the adjacent mucous surfaces ulcerated and became adherent, this mode of healing might take place. But it seems to me that there is considerable doubt in any given case whether such a result will occur. If the perfect occlusion did not take place, we would have the risk of infectious material passing out into the peritoneum. When I have mentioned these misgivings to surgeons, I have been pointed to the common practice of treating the stump in ovariotomies, even when the tubes are ligated. But the tubes seldom contain such numbers of virulent micro-organisms as the intestine does.

The case in point was one in which laparotomy was done for ovarian tumor. The appendix was closely adherent to the growth, was torn in loosening it and was ligated after thorough sterilization of the end. The woman did well for nearly a week and then died a few minutes after the occurrence of pain in the heart region and left shoulder, with feeling of suffocation. The cause of this was found on autopsy to be a recent thrombus in the right coronary artery, due to extensive atheroma. (It was afterwards learned that the woman had had similar anginose attacks, at long intervals. There was no evidence of heart lesion before death.)

The laparotomy wound and the seat of the

(Continued on Page 356)

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(1) 1926. U. S. Dept. of Commerce, Bureau of Fisheries, Document No. 1000.
1934. U. S. Pub. Health Reports 49, 754.
1937. U. S. Dept. Agr. Misc. Publ. No. 275.
1938. Food Research 3, 549.
1939. U. S. Dept. of Commerce, Bureau of Fisheries Investigational Report No. 41.

The Seal of Acceptance denotes that the nutritional statements in this advertisement are acceptable to the Council on Foods and Nutrition of the American Medical Association.

(Continued from Page 354)

operation were in perfect condition, with healing far advanced.

The stump of the appendix was in contact with the lower part of the rectum. Around it was about 1 c.c. of yellow pus, which was removed and covers made at once for staining. The ligature (catgut) had ulcerated into the mucous membrane for about 4 mm. There was no attempt at covering over the ligature by exudation from the serosa. The pus contained large numbers of bacteria, including four kinds of bacilli, one of which was probably the common colon bacillus. At any rate the variety of forms makes it certain that the organisms came from the intestine, and were not introduced at the operation.

Owing to the accidental death, the infection was of no consequence. Had the patient lived longer, she would have had general peritonitis, most probably (there were no limiting adhesions), or at best circumscribed suppuration, with rupture into the rectum and the suspicion of infection at the operation.

IN TIME OF WAR WE MUST PREPARE FOR PEACE

To the realistic observer there is ample evidence that the economics of private medical practice is rapidly changing. The government, under stimulus of the emergency, has expanded its functions and activities to the point where there is hardly any distinction between the usual concept of public health and individual medical care. If these broadened measures serve to strengthen home morale and help bring about the defeat of insatiable aggressors, then in the interests of the nation and its allies organized medicine considers it a sacred privilege to coöperate with every legitimate agency in an effort to do the job smoothly and efficiently. There can be no compromise with Patriotism.

However, in an all-out endeavor to win the war, let us not sacrifice needlessly professional freedom when the struggle is over. Wars always bring permanent social reforms. Some are good, others not so good, and still others distinctly bad, depending upon the intelligence, sincerity, and ability exercised by leaders. In the end, however, social changes are the outgrowth of demands of the masses. In a democracy the citizens themselves shape the destiny of their institutions.

The corollary is obvious. The physician has an important function in popularizing the ideals and aims of American Medicine, its nature and achievements under free enterprise, its service to the individual, the community and to society as a whole. Simple truths told to every patient by every physician, when the opportunity presents itself, in simple language in favor of our present system will be more effective than any oratorical harangue against the American Medical Association by misguided crackpots and professional reformers.

In this connection it is well to remember that the National Physicians Committee for the Extension of Medical Care is attempting to disseminate information on American Medicine through many channels. This Committee deserves the support and assistance of every physician. In the light of the Nine Freedoms which President Roosevelt has enunciated in his recent message to Congress few will question the necessity of widespread public appreciation of medical achievement under a system of free enterprise.—*Nebraska State Medical Journal*, April, 1942.

BIRTH RECORDS IN WAR PERIOD

"The old belief," says the *Medical Record*, "that in and after a war more boys are born than in normal times was confirmed by the experience of the first world war. During the last years of that war, and for some years afterward, the proportion of male births increased over the average figure, which is about 106 live male births to every 100 live female births. . . . Today, two reasons have been found to explain the higher male births in the years after a war. One is the fact that, as a consequence of the high number of marriages contracted after wars, the number of first-born children increases and that among the first-born the rate for boys is especially high in all countries. The second reason is the decrease of miscarriages after wars, due to the high desire for more children. This means a higher male rate among live births, because among stillbirths and miscarriages there is a much higher proportion of males than among live births. According to the latest data, for every 1,000 live births in the United States there are thirty-two stillbirths, eighteen males and fourteen females, or a sex ratio of 128 males to 100 females. These are explanations which seem probable but the problem has not been solved entirely so far."

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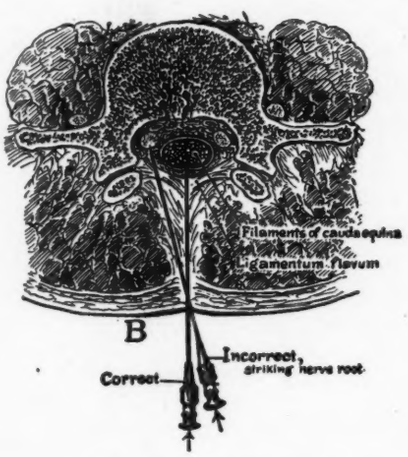
Two Decades of Service in Neurosyphilis

DIAGNOSIS



Lumbar Puncture

• From *The Modern Treatment of Syphilis*, by Joseph Earle Moore, M.D. Charles C. Thomas, Springfield, Ill., and Baltimore, Md., 1933. By courtesy of author and publisher.

CHEMOTHERAPY

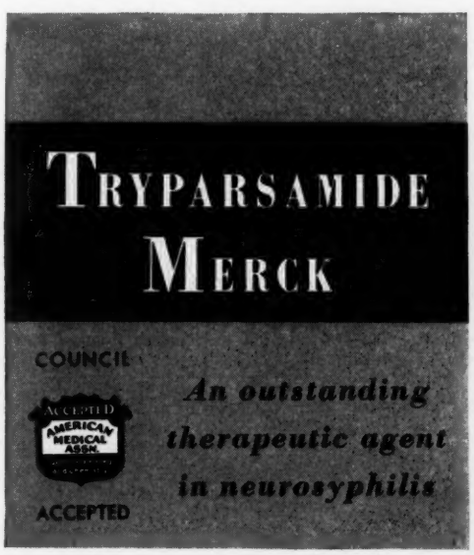
For Victory—Buy United States Savings Bonds and Stamps

ADVANTAGES

- Unusual power of penetration, especially in case of the central nervous system.
- Prominent status in the therapy of neurosyphilis.
- Does not require hospitalization when used alone.
- Easy to administer.
- Inexpensive.
- Available to patients through the services of their own physicians.

•

LITERATURE ON REQUEST



MERCK & CO. Inc. *Manufacturing Chemists* RAHWAY, N. J.

Say you saw it in the Journal of the Michigan State Medical Society

MICHIGAN PHYSICIANS IN MILITARY SERVICE

The following list is supplementary to the one which was published on pages 272 to 278 of the April issue of THE JOURNAL. The list is made up from various reports received by the State Society, and it is recognized as incomplete. Corrections, changes or additions to the list are solicited as it is desired to list insofar as is possible the name and address of every Michigan doctor of medicine who is serving his country with the armed forces.

Barry—
Lt. Com. K. S. McIntyre, Navy Medical Corps, Pensacola, Fla.

Berrien—
Robert Reagan, M.D., Great Lakes Base Hospital, Great Lakes, Illinois

Calhoun—
Lieut. R. J. Campbell (Navy), Portsmouth, Massachusetts

Chippewa-Mackinac—
Wm. Birch, M.D., Fort Custer
L. J. Hakala, M.D., on duty with the U. S. Public Health Service

Jackson—
Lt. Com. Edward D. Crowley, Navy Medical Corps, Pearl Harbor, T. H.

Kalamazoo—
Charles O. Holder, M.D., Kalamazoo Induction Center, Kalamazoo

Kent—
J. Donald Flynn, M.D. (Navy), Navy Pier, Chicago, Illinois
C. D. Klaus, M.D. (Navy), Navy Pier, Chicago, Illinois
Millard Shellman, M.D. (Navy), Naval School, Bethesda, Maryland

Lenawee—
W. T. Claxton, Lt. MC, Fort Sill, Oklahoma

Macomb—
R. F. Salot, M.D., Navy Medical Corps (home address, Mt. Clemens)

Muskegon—
Lieut. A. F. Dasler, Navy Medical Corps, Great Lakes, Illinois

Oakland—
Donald M. Hoyt, M.D., Navy Medical Corps (home address Pontiac)
Donald S. Smith, M.D., Navy Medical Corps (home address Pontiac)

Ottawa—
H. P. Harms, M.D., Navy Medical Corps, San Diego, California

St. Joseph—
Martin F. Buell, M.D., U. S. Public Health Service, Bethesda, Maryland

Tuscola—
Frank J. Gugino, Lieut. Navy Medical Corps, Great Lakes, Illinois

Washtenaw—
C. J. Buscaglia, Capt., M.C., Iceland
Kyril B. Conger, Lt., M.C., Randolph Field, Texas
Vivion F. Lowell, Capt., M.C., Columbia, S. Carolina

Wayne—
Louis Beresh, Army Medical Corps, Romulus, Michigan
Leslie Caplan, Army Medical Corps, Pine Bluff, Arkansas
K. K. Kimberlin, Army Medical Corps, Camp Jackson, S. Carolina
George J. Korby, U. S. Engineers, Honolulu, T. H.
Gaylord S. Bates, Lt. Com., Navy Medical Corps, Mare Island, Calif.
Harold J. Kullman, Navy Medical Corps, Great Lakes, Illinois
Stanley V. Laub, Lieut., Navy Medical Corps, U. S. Naval Academy, Annapolis, Md.
Peter G. Shifrin, Navy Medical Corps, Mare Island, Calif.

Corrections:

Lenawee—Perry Lynford Miller, Capt. M.C., is stationed at Camp McCoy, Wisconsin, instead of in Detroit.

Wayne—H. C. Jones, Lt. Com., Navy Medical Corps, is now at Portsmouth, Virginia, instead of Great Lakes, Illinois.

Robert K. Whitely, now a Captain in the Army Medical Corps was stationed at Manila, Philippine Islands, his last known address. He was erroneously reported as a Lieutenant stationed in Detroit.

Corrections, changes or additions to the above list will be welcomed and should be sent to the Michigan State Medical Society, 2020 Olds Tower, Lansing, Michigan.

BONDS FOR VICTORY

The Treasury Department offers "freedom" Bonds and Stamps within the purchase range of all Americans. These are the United States Defense Savings Bonds and Stamps. The largest Defense Bond costs $10,000. The smallest Defense Stamp costs 10 cents. This is the people's investment program—through which we as individuals invest our dollars in the war effort. At the same time our investments build toward our own future security.

There are three series of Defense Savings Bonds: Series E, F, and G. Series E Bonds, the "People's Bonds," may be bought only by individuals and may be obtained at any postoffice and almost any bank. A Bond of this series may be registered in the names of one or two individuals or in the name of one person with a second listed as beneficiary. The smallest costs $18.75 and pays $25 at the end of ten years—a 33⅓ per cent increase in value.

Series F Bonds are also appreciation bonds but these may be purchased by associations and corporations as well as individuals. A Series F Bond costs 74 per cent of its face value and the Government pays back the full face value amount at the end of the 12-year maturity period. The smallest bond of this series costs $18.50 and pays $25 at maturity; the largest costs $7,400 and pays $10,000.

Unlike the Series E and F Bonds, the Series G Bonds cost the same as their face value and pay interest semi-annually at the rate of 2.5 per cent. The G Bonds are 12-year bonds and are issued in denominations from $100 to $10,000. Although Bonds of Series F and G are issued only by Federal Reserve Banks and the Treasury Department, commercial banks generally will handle applications for them.

We face the crises of world conflict with an unflinching spirit, whether this be the members of the Michigan State Medical Society serving with combat troops and in base hospitals, or those of us on the home fronts serving the armed and civilian forces. It is our job to help provide the sinews of war—to buy and continue to buy Bonds for Victory.

To the immature digestive system that must consume food in quantities necessary for rapid growth, quality is of prime importance. Similac provides breast milk proportions of fat, protein, carbohydrate and minerals, in forms that are physically and metabolically suited to the infant's requirements. Similac dependably nourishes the bottle fed infant — *from birth until weaning.*

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A powdered, modified milk product especially prepared for infant feeding, made from tuberculin tested cow's milk (casein modified) from which part of the butter fat is removed and to which has been added lactose, vegetable oils and cod liver oil concentrate.

ATLANTIC CITY JUNE 8 1942 AMA

AMERICAN MEDICINE PREPARES FOR WAR

****No finer example of medicine's greatness as a power in National Defense, nor a greater indication of its solidarity, can be found than the evidence of coöperation which has been manifested during the last two years.

****There have been many problems and dislocations in the lives of members of the professions, routine of professional schools and hospitals and services in many communities. Selective Service for military service enjoins an equal responsibility upon all our male citizens; expansion of our military forces demands an increase in medico-military personnel and establishments. All these aspects of medicine's participation in National Defense have caused concern, and effective measures have been taken to clear up every problem in the interest of national and community health, medical education and military needs. In spite of these trying problems, during the last year or more, American medicine has forged armament for war.

****Almost constantly, for nearly two years, committees representing every phase of medicine have been in session at the National Research Council. Distinguished men serve on the ten main committees and the thirty-three subcommittees thereof. Exhaustive studies have been made on chemotherapy, transfusions, neuropsychiatry, aviation medicine, infectious diseases, tropical medicine, surgical infections and venereal diseases. The committee on medicine has subcommittees devoting study to important subjects, such as cardiovascular diseases, tuberculosis, metabolism, medical nutrition, clinical investigations and diagnosis and therapeutics. Surgery is represented by a strong and important group of subcommittees, namely, neurosurgery, plastic and maxillofacial surgery, otolaryngology, vascular injuries, orthopedic surgery, et cetera. Outstanding work has been done on shock and surgical infections. Every effort has been made to assist The Surgeon General by making available the most advanced and accepted approach to the medical and surgical problems confronting the Army in time of war.

Furthermore, this great group of distinguished and patriotic doctors has collaborated in the preparation of fourteen manuals on these important subjects. These manuals will be used in the training programs for the Medical Department of the Army and as the authorized standards in the practice of military medicine therein. This effort probably represents the greatest single project for the welfare of our nation and its Army in which medicine, dentistry and veterinary medicine have been participated.

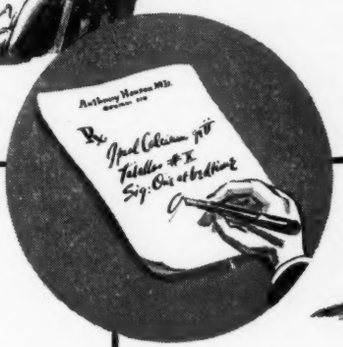
****The Surgeon General is unquestionably supported by the entire medical profession in his responsibilities—actually, the responsibilities of the Nation—in the care of the sick and wounded in the military service. The American soldier has a right to expect adequate protection against disease, thorough treatment when sick or injured and skillful surgical care if wounded in battle. He anticipates either a return to duty or restoration to a place of independence in his home community and social circle.

****One of the most colorful chapters in the history of American Medicine was written at the Army and Navy bases in Hawaii on Sunday, December 7. During sixteen hours of heroic effort, Navy doctors and nurses, aided by assistants from Honolulu, labored untiringly in behalf of the 960 casualties, many horribly burned and wounded. At the Army Base, within a few minutes after the first bomb fell at 7:00 a.m., wives of officers and enlisted men were rushing to Hickam Field Hospital to assist the six nurses on duty at the time. Army doctors worked until they dropped from exhaustion. Large stores of plasma and other blood substitutes were used and their value was demonstrated beyond any question. The incalculable value of sulfonamide therapy was remarkable and kept the fatalities down to a remarkably low figure. All the huge effort to make chemotherapy a useful aid in treating war casualties proved the soundness of medicine's early preparation to meet war-time demands. Severe shock was observed and anti-shock therapy was imperative. Dr. Pinkerton, head of the Civilian Plasma Bank of Honolulu, had been highly commended for his prompt delivery of plasma and blood substitutes. John Moorhead, M.D., of New York, Perrin Long, M.D., of Johns Hopkins and I. S. Ravdin, M.D., of Pennsylvania assisted in the care of the

(Continued on Page 362)

Extracts from an address by Brigadier General Fairbanks before the Kent County Medical Society, February 10, 1942.

IPRAL induces sound restful sleep closely resembling the normal. By dulling the consciousness of physical and mental discomfort it helps the patient rebuild vital resources. Dosage is small . . . absorption and elimination rapid . . . and cumulative effects avoidable by proper dosage regulation.



6 to 8 HOURS RESTFUL SLEEP

HOW SUPPLIED

IPRAL CALCIUM (calcium ethylisopropylbarbiturate) in 2-grain tablets and in powder form for use as a sedative and hypnotic. ¾ grain tablets for mild sedative effect throughout the day.

IPRAL SODIUM (sodium ethylisopropylbarbiturate) in 4-grain tablets for pre-anesthetic medication.

For literature address the Professional Service Department, E. R. Squibb & Sons, 745 Fifth Avenue, New York, N. Y.

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Manufacturing Chemists to the Medical Profession Since 1858

(Continued from Page 360)

wounded or observed the results of the prompt and efficient work of the Medical Department personnel. Truly, the careful planning and stupendous efforts of American medicine in its National Defense efforts were repaid many times over in the results secured in the care of the Hawaiian casualties.

****The primary objective of the Procurement and Assignment Service is to maintain a complete list of all physicians, dentists and veterinarians of the entire country with detailed information as to age, physical condition, professional qualifications and availability for service in the various military, civil and industrial agencies of the country. This information has been tabulated on punch cards. All agencies of the Government which utilize the services of physicians, dentists and veterinarians will make requisition upon the Procurement and Assignment Service for personnel. These requisitions will state the age, professional qualifications and the physical condition of these professional people whose services are desired by these agencies. Lists will be prepared from the rosters and forwarded to the requisitioning agency. These agencies will then enlist the services of these professional people. At the same time, the Procurement and Assignment Service will notify the people whose names have been tendered to the requisitioning agency that they have been chosen to enter upon their new duties.

Through the various committees serving the Procurement and Assignment Service, surveys are rapidly being made of all the facilities of the United States. For example, every hospital will be canvassed and they will be asked to state the minimum number of professional people required to maintain adequate care of the sick of these institutions. In the same manner, the needs of school faculties, industrial organizations, national, state and county health organizations, and other agencies, both military and civil, will be surveyed.

****Laying aside all personal desires and ambitions, our task is one which calls for devoted service and willing sacrifice. As the healing power which must combat the destructive forces unleashed by this terrible war, American medicine will unselfishly answer the demands of our beloved nation as it faces the grave dangers and tragic uncertainties ahead.

LET'S ALSO REMEMBER OUR INTERNAL ENEMIES

While heeding the war cry "Remember Pearl Harbor" and going all-out as a profession in our nation's war effort, let's also remember that the perennial enemies of good medical practice inside the United States are still with us. There is ample evidence that these enemies are just as active as they were three or four or five years ago.

Washington still contains that same coterie of "uplifters" who like to uplift with O.P.M.—in this case an abbreviation for Other People's Money—who publicize the idea that they are uplifting the masses of the people but whose deeds contrast with their words when they primarily uplift themselves and their friends into bureaucratic political machines. It is perhaps unfortunate that the President could not be specific when he assailed Washington "parasites." We could point out a few for him.

Colorado still contains its advertising charlatans, its chiropractic radiocasters, its fraudulent petition circulators who perennially would like to tinker with the State Constitution and open the practice of the healing arts to the quacks of all kinds. Utah still has the same problem, complicated by the ridiculous action of a legislature which authorized "naturopaths" to diagnose and treat under Workmen's Compensation Laws. Wyoming is not exempt.

And all of these states have their quotas of long arms reaching out from the master "uplifters" in Washington, driving in a wedge here, a salient there, inching their way farther and farther into medical practice to the detriment of good practice, basically spelling poor health for both the public and the medical profession in the future. These internal enemies of the American way of life have not "converted their plants to war production." On the contrary, they see in this war an excellent opportunity to entrench themselves even deeper—while we and the whole public, all lumped together as Mr. Taxpayer, have our eyes fixed steadily in another direction—on war work.

Yes, let's remember Pearl Harbor and Manila and let's look straight at the job of winning the war. But if we keep our eyes wide open, out of one corner at least we can spot what our internal enemies are doing. Let's guard carefully against their insidious bribery with "federal" funds—which come right out of our own patients' pockets and are not more "federal" or remote than our own purses. Let's remember that 1942 is an election year, war or no war, and that cultists may try some new tricks. Let's keep ever in mind that while the rest of us are primarily interested in the war effort, it will be "business as usual" for all the enemies of the American way of life, including the enemies of good American medicine.—*Rocky Mountain Medical Journal,* March, 1942.

"The birth rate took a jump in 1941. We got two and one-half million bundles from heaven to help us pay the national debt."—HOWARD BRUBAKER, in *The New Yorker.*

BIOLAC is complete and replete...

...because there is no lack in Biolac, except for vitamin C. Biolac feedings provide amply for all other nutritional requirements of the normal young infant, and no additional formula ingredients or supplements are necessary. It's an improved evaporated-type infant food with breast-like nutritional and digestional advantages. It is a complete formula, replete with nutritional values. Biolac is prepared from whole milk, skim milk, lactose, vitamin B_1, concentrates of vitamins A and D from cod liver oil, and ferric citrate.

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COUNTY MEDICAL SOCIETY MEETINGS

Bay-Arenac-Iosco—Wednesday, March 25, 1942—Bay City—Speaker: Wm. S. Reveno, M.D., Detroit—Subject: "Metabolism."

Berrien—Thursday, April 16, 1942—Benton Harbor—Speaker: Major C. I. Owen, MC, Lansing—Subject: "Medical Aspects of the Selectee."

Calhoun—Tuesday, April 7, 1942—Battle Creek—Speaker: Herman H. Riecker, M.D., Ann Arbor—Subject: "Undulant Fever."

Clinton—Monday, April 13, 1942—St. Johns—Joint meeting with members of the County Bar, and Pharmaceutical organizations—Speaker: Mr. C. W. Otto, Lansing.

Dickinson-Iron—Thursday, April 2, 1942—Iron River—Speakers: Drs. Banbury, Itzov and York.

Genesee—Tuesday, March 24, 1942—Flint—Speaker: Mr. Russell V. Somes, Chief Air Raid Warden of Flint—Subject: "National and Local Civilian Defense Preparations."

Wednesday April 8 and April 15—Postgraduate Conferences.

Hillsdale—Thursday, March 26, 1942—Hillsdale—Speaker: F. J. Weber, M.D., Lansing—Presentation of sound, color movies on Diagnosis and Treatment of Syphilis.

Ingham—Tuesday, April 21, 1942—Lansing—Speaker: N. F. Miller, M.D., Ann Arbor—Subject: "Cervicitis."

Kalamazoo—Tuesday, April 21, 1942—Kalamazoo—Speakers: S. Milton Goldhammer, M.D., and Jean P. Pratt, M.D., Detroit—Subjects: "The Therapeutics of Whole Blood, Plasma and Serus" and "Estrogenic (steroid) Hormones."

Kent—Tuesday, April 14, 1942—Grand Rapids—Speaker: Carl Beeman, M.D., Grand Rapids—Subject: "Shock."

Muskegon—Friday, April 17, 1942—Muskegon—Speaker: Loyal Davis, M.D., Chicago—Subject: "Neuro-Surgery."

Oakland—Wednesday, April 1, 1942—Rotunda Inn—Speaker: A. C. Furstenberg, M.D., Ann Arbor—Subject: "Modern Treatment of Diseases of the Nose and Throat."

St. Clair—Tuesday, March 24, 1942—Port Huron—Business Meeting.

Tuesday, April 7, 1942—Imlay City—Special Meeting with Lapeer County Medical Society—Speaker: Frank Van Schoick, M.D., Jackson—Subject: "Nationwide Program of Immunization Against Smallpox and Diphtheria."

Tuesday, April 14, 1942—Port Huron—Business Meeting.

St. Joseph—Thursday, April 9, 1942—Constantine—Speaker: Milo K. Miller, M.D., South Bend, Indiana—Subject: "Pediatrics and Allergy."

Shiawassee—Thursday, March 19, 1942—Owosso—Speaker: Francis J. Murphy, M.D., Detroit—Subject: "Advances in Anesthesia."

Thursday, April 16, 1942—Owosso—Speaker: Wallace Teed, M.D., Ann Arbor, Subject—"Concealed Mastoiditis."

Washtenaw—Tuesday, April 14, 1942—Ann Arbor—Program: The Physician and Emergency Medical Service, Civilian Defense—Reports of Local Directors. Chairman. Warren E. Forsythe, M.D.

Wayne—Monday, April 27, 1942—Detroit—Speaker: John S. Lockwood, M.D., Philadelphia, Subject—"The Use of Sulfonamides in Surgery."

Monday, May 4, 1942—Detroit—Annual Meeting—Election of Officers, West Side (Detroit)—Wednesday, March 18, 1942—Detroit—Speakers: O. A. Capano, M.D., Frank A. Lamberson, M.D., Eugene W. Secord, M.D., and Edward F. Ducey, M.D.

COUNCIL AND COMMITTEE MEETINGS

1. Executive Committee of The Council with Michigan Crippled Children Commission—Wardell Hotel, Detroit—Thursday, April 2, 1942—4 p.m.
2. Executive Committee of The Council—Hotel Olds, Lansing—Thursday, April 9, 1942—3 p.m.
3. Medical Preparedness Committee—Wardell Hotel, Detroit—Monday, April 27, 1942—6:30 p.m.
4. Committee on Distribution of Medical Care—Olds Hotel, Lansing—Wednesday, May 6, 1942—3:00 p.m.
5. Syphilis Control Committee—Olds Hotel, Lansing—Sunday, May 10, 1942—5:00 p.m.
6. Executive Committee of The Council—Wardell Hotel, Detroit—Thursday, May 14, 1942—4:30 p.m.

TWENTY-EIGHTH ANNUAL GOLF TOURNAMENT

The American Medical Golfing Association will hold its twenty-eighth annual tournament at Seaview Country Club, Atlantic City, on Monday, June 8. Forty trophies and prizes will be awarded.

Fellows in Every State in the Union

Harry E. Mock, M.D., of Chicago, is president, and John B. Morgan, M.D., of Cleveland, and H. V. Hubbard, M.D., of Plainfield, New Jersey, are vice presidents of the A.M.G.A. which was organized in 1915 by Will Walter, M.D., Wendell Phillips, M.D., and Gene Lewis, M.D., and now totals 1,651 members representing every state in the Union.

Two Eighteen-hole Championship Courses

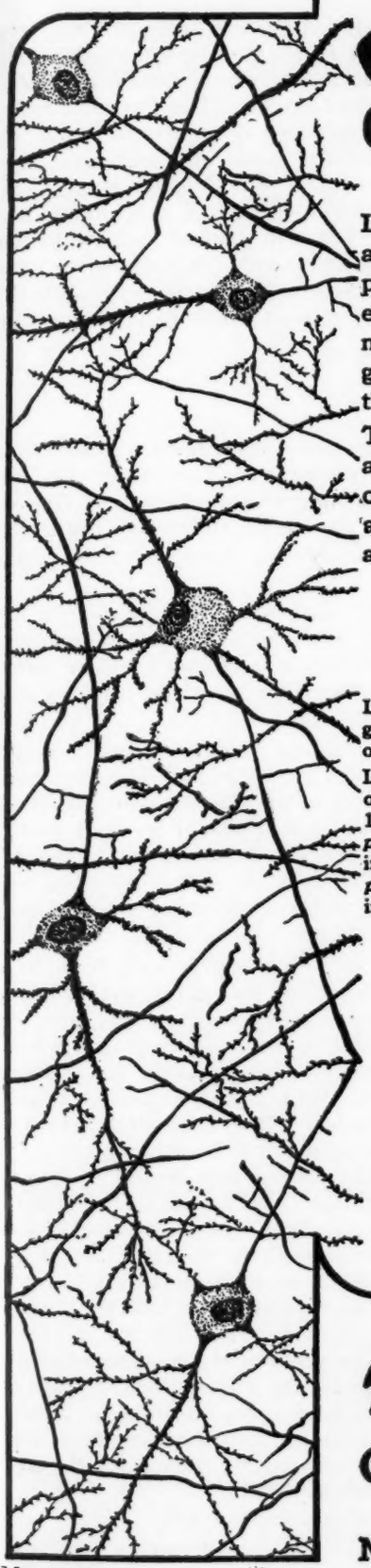
Seaview Country Club at Absecon, New Jersey, has two eighteen-hole championship courses as well as another sporty course through the woods. The clubhouse, where the golfers' banquet will be held at 7:00 p.m. on June 8, is one of the most elaborate in the country, featuring a tremendous indoor salt-water pool. The 250 bedrooms for guests will be available to A.M.G.A. Fellows who may write Walt P. Conaway. M.D., Chairman of the Atlantic City Golf Committee, 1723 Pacific Avenue, Atlantic City, New Jersey, for reservations.

Application for Membership

All male Fellows of the American Medical Association are eligible and cordially invited to become members of the American Medical Golfing Association. Write Executive Secretary Bill Burns, 2020 Olds Tower, Lansing, Michigan, for an application blank. Participants in the American Medical Golfing Association tournament are required to present their home club handicap, signed by the club secretary, at the first tee on the day of play. No handicap over thirty is allowed. Only Active Fellows of the American Medical Golfing Association may compete for prizes. No trophy is awarded a Fellow who is absent from the annual dinner.

The next examinations by the Michigan Board of Examiners in the Basic Sciences will be held on Friday and Saturday, June 12 and 13, 1942, at Detroit and Ann Arbor. Applications should be made to Miss Eloise LeBeau, 101 N. Walnut Street, Lansing, Michigan, no later than June 1.

IN CONDITIONS OF *Excitement* OF THE NERVOUS SYSTEM



Luminal and Luminal Sodium exert a pronounced sedative and antispasmodic action. Hence, they are extensively employed for symptomatic relief in conditions characterized by excitement of the nervous system. These include epilepsy, nervous insomnia, neurasthenia, hyperthyroidism, cardiac and gastric neuroses, hypertension, dysmenorrhea and disorders of the climacteric.

The tranquilizing effect of Luminal and Luminal Sodium has also been found useful in the management of tetanus, vomiting of pregnancy, eclampsia and the spastic disorders of infancy and childhood, such as pyloric spasm, spasmophilia, chorea and pertussis.

Write for informative 24 page booklet containing the essentials regarding the use of these sedatives.

HOW SUPPLIED

LUMINAL: *Tablets* of ¼ and ½ grain (bottles of 100) and of 1½ grains (bottles of 50). *Elixir of Luminal,* ¼ grain per teaspoonful (bottles of 4 ounces and 12 ounces).

LUMINAL SODIUM: *Tablets* of ¼ and ½ grain (bottles of 100) and of 1½ grains (bottles of 50), for oral use only. *Hypodermic tablets* of 1 grain (bottles of 50) for subcutaneous or intramuscular injection. *Ampules* of 2 grains and 5 grains (boxes of 5, 25 and 100) for subcutaneous, intramuscular and (exceptionally) intravenous injection; also *solution in propylene glycol,* ampules of 2 cc. = 5 grains (boxes of 5 and 100), for intramuscular injection.

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READERS' SERVICE

TUBERCULOSIS—A FOE ABLE TO FIGHT

Prognosis in tuberculosis depends on a willful combination of factors, chief favorable one being early diagnosis. Mass search has produced startling results in driving tuberculosis from first place down to seventh among national death causes. Outstanding in this field is the work proceeding in many colleges and universities. Individual practitioners must not decide that modern methods succeed only in community surveys or remain the exclusive implements of specialists. Nor must medicine strengthen its techniques only during periodic national emergencies.

Tuberculin test, x-ray, with painstaking clinical, laboratory, epidemiological follow-up of patients and contacts are available to every physician. To wait for consumptive symptoms or to rely primarily on the stethoscope is to diagnose late—inexcusable in the light of common knowledge and professional obligation. Based on the mistakes and unfortunate results of World War I, present induction chest surveys are encouraging but still need universal adoption if all citizens are to benefit.—CHARLES E. LYGHT, M.D., Northfield, Minnesota. (See page 377.)

THE DIAGNOSIS AND TREATMENT OF PLACENTA PREVIA

The incidence of placenta previa among 14,569 deliveries at the University of Iowa was 1:204. Sterile vaginal examination represents the only *certain* method of diagnosis, although bladder cystograms are helpful. The more severe grades of placenta previa tend to produce symptoms during the third trimester of pregnancy and cause prematurity, since delivery should generally follow the establishment of the diagnosis.

The method of treatment varies, but excellent results may be obtained by spontaneous labor and scalp traction in more than three-fourths of all cases. Manual dilation of the cervix has no place in the treatment. Vaginal packing and Braxton Hicks version should be employed only when other facilities are not available. Blood transfusion is the most important single factor in treatment.—WILLIAM F. MENGERT, M.D., Iowa City, Iowa. (See page 382.)

LOCALIZATION—AN AID IN THE DIAGNOSIS OF CONTACT DERMATITIS

From the response to a questionnaire which was sent to leading allergists and dermatologists and from my own experience, diagrams are presented which show the most common localizations of contact dermatitis, the site of which is indicative of the causative agents. Their perusal readily facilitates a causative diagnosis in many instances. Occupational, medicinal, and plant dermatitis do not assume a typical localization. The factors determining localization in contact dermatitis are discussed. In general the site of the first lesions is at the approximate positive contact with the offending material.—GEORGE L. WALDBOTT, M.D., Detroit, Michigan. (See page 392.)

TRAGEDY

Eighty-seven years ago a male infant was born in a farmhouse in east central New York State. He was destined to be a follower of Aesculapius and Hippocrates and he finally entered the University of Michigan Medical School, graduating from there fifty-eight years ago.

Then came eight years of general practice in the farming community near where he was born—enduring the hardships of the long winters with travel by horseback or on foot and the rather precarious existence of a general practitioner of that era.

Motivated by a desire to be more expert in certain lines, he moved to New York City and spent nine years specializing in diseases of the eye, ear, nose and throat under the tutelage of the best men of the times in that metropolis. Finally, he considered himself capable of doing good work alone in his chosen specialty and moved to the great Midwest where he practiced long and faithfully.

This devotion to his work reaped a fairly decent harvest. He owned his home and a car and had two daughters in college. But the rigors of his early life and the never-ending duties of a physician began to take their toll in the inexorable passage of the years. There came at this time what seemed to be an excellent chance to build his life's savings into a fund sufficient to take care of him and his spouse in their declining years.

The Old Lady with the Scissors decided to have it otherwise and, just short of the amount he had planned on being a sufficient profit to accomplish what he had in mind, the market dropped to the cellar and all of his long and painfully acquired assets were wiped out.

Of sturdy stock, he bore up better than the average human being could have done and still the shoulders began to droop and become a little more rounded as the days went by. With his car gone, he had to walk to and from his office, twice a day and thus he became a familiar figure along his daily route, stooped over more and more and carrying the insignia of the physician—the little black satchel.

(Continued on Page 368)

These are the Reasons why we say "Try S-M-A"

- Physicians will find that S-M-A* is not a "compromise formula." It is a complete milk formula for infants deprived of human milk.
- Cows' milk fat is replaced with the unique S-M-A fat for easy digestion and adequate nutrition. It compares physically, chemically and biologically with the fat in human milk.
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*S-M-A, a trade mark of S.M.A. Corporation, for its brand of food especially prepared for infant feeding—derived from tuberculin-tested cow's milk, the fat of which is replaced by animal and vegetable fats, including biologically tested cod liver oil; with the addition of milk sugar and potassium chloride; altogether forming an antirachitic food. When diluted according to directions, it is essentially similar to human milk in percentages of protein, fat, carbohydrate and ash, in chemical constants of the fat and physical properties.

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(Continued from Page 366)

Some people wondered what the old man carried in the satchel and most of them naturally supposed it contained bandage scissors, a few instruments, some rolls of bandage, cotton and adhesive, little labelled bottles of pills, a stethoscope, tongue blades and possibly a blood pressure apparatus.

Then came a day—one week before his thirty-fourth wedding anniversary which was also the day he would have been halfway to his eighty-seventh birthday. It was icy underfoot and his slowly dimming eyes could not see all the safe places. A slip, a crash, and the doctor lay on the sidewalk with a broken hip while the mysterious black bag with its frayed edges and battered corners lay twenty feet away, sprung open by the force with which it fell.

Two men, one a neighbor and one a passing motorist, helped him into his home two doors away. The neighbor picked up the bag, the problematical contents of which had often caused him some speculation and at last he found what was in it:

Nothing! Not even a complete lining!

Men do not grow old gracefully as do most women—particularly medical men. They put up a terrific battle against admitting that the years are telling on them, to their own discredit more often than not. Few of them have any financial sense or ability and seldom has there been any nest egg laid away for the twilight of life so they can rest deservedly and serenely.

This same lack of financial acumen probably explains why the medical profession, the closest knit known body of presumably intelligent men, has, unlike almost every known lodge or fraternal body in the United States, never formulated any plans to take care of its ancient or decrepit brethren. It has been so busy making money for the present, striving to attain and maintain an individual social level, taking postgraduate work, buying books and instruments and fighting the invasion of the cults, that it has lost sight of the future.

In the ethical pursuit of the practice of medicine every other doctor is a friendly competitor as a rule. Even the friendliest competition is time consuming and each doctor is prone to think of his work and his life in terms of only himself and his family. The most probable instantaneous reply one would get from a doctor if he were asked about state-wide old age pension for doctors would be: "Am I my brother's keeper?" and to this he would probably add: "There will never be a need for it as far as I am concerned because I am too smart to let it happen to me."

Let us hope that no more Jackson doctors will have to trudge wearily to their office, with house and office rent in arrears, trying to be independent and make a living at eighty-six and a half years, carrying the honored black bag to make the bluff at success complete and then go down with a crash for casual passersby to pick up and find the medicine bag—

EMPTY!

—*The Bulletin of the Jackson County Medical Society,* March, 1942.

PAPER PHOBIA

Few words in the medical lexicon carry as much contempt as the phrase: "paper-work." Every doctor who serves the government, a social agency, an insurance company, or an industrial plant complains that he is strangled by paper-tape, and protests the need for monotonous entry and re-entry of data on complicated printed forms.

The doctor's ready answer is to abandon the "paper-work" to some clerical assistant. This, he feels, frees him for the diagnosis and treatment of illness. But the matter is not so simple. The assignment of such work to medically untrained personnel invites errors, blurs the physician's own grasp of the distribution of his findings, and makes one more inroad in the already too common tendency to divert medical procedures into non-medical hands.

There is something to be said for the bogey of paper-work after all. It is a practice which builds up habits of precision, forces a certain amount of orderliness into the writer's thinking, and arouses a consciousness of the fact that the individual physician's task is only one part of a greater job. For instance, the physician who carefully fills in all the blanks on a death certificate is compelled to organize his diagnostic terms into some standard nomenclature. When a certificate is returned because "apoplexy" is not an acceptable work, and "thrombosis" or "hemorrhage" or "embolus" is the approved term, the doctor has to pause a moment, weigh the possibilities of embolus, hemorrhage and thrombosis, and determine which most closely conforms to the clinical picture. It is not a bad discipline; certainly it discourages the slovenly thinking which would dismiss the death as "apoplexy."

The mere recording of data on a communicable disease report form symbolizes the fact that this one case is but a single item in the flow of copy to a health department, and is a fragment of the battery of findings on which all our vital statistics are built. The construction of valid statistical data, in turn, is the basis for life insurance rates, an orientation point for health department activities, a brief for health-minded legislators, and a yardstick for measuring the adequacy of the community's medical care. Our entire structure of vital statistics—and all the services and activities which stem from them—would tumble in a year if individual doctors failed to submit accurate reports of births, deaths and illnesses.

The doctor who serves an Old Age Assistance Board, a City Relief Department or any other government agency is inclined to grumble at the elaborate forms which he has to fill in order to collect his fee. Yet the entire machinery of governmentally-subsidized medical care would stall without the statistical foundation on which the budget allotments are based; and these in turn, are built up by the accumulation of the much abused forms.

The distribution of potent drugs like the opiates, barbiturates and sulfonamides, can be regulated only by limiting their prescription to physicians. But concurrent with the monopoly thus given to the doctor, is a duty to restrict the distribution of these drugs, which is possible only by a kind of professional policing which requires much paper work.

This is not to deny that the geniuses who construct the blanks and questionnaires are often at fault for arranging the forms badly and for demanding unnecessary details. But to respond by ignoring the blanks or by submitting carelessly framed answers is no solution.

In this day of increasing governmental interest in the physician's activities, the doctor who is careful, patient and thorough in the routine task of filling out forms is the one who builds up in the official files a personal record for reliability, meticulousness and accuracy. The physician who submits forms dotted with illegible scrawls or yawning with wide open spaces, enters himself in the books as hasty, careless or inaccurate: an unjustified conclusion to be sure, but an inevitable one.

Birth certificates, commitment papers, sick lists, quarantine reports, communicable diseases notifications, death certificates, narcotic registration applications, prescription blanks, questionnaires, disability reports, and all the other time-taking ink-absorbing jobs are petty nuisances. But they need not stand in the way of the doctor's personal or professional progress; after all, no practitioner worthy of his license will let himself be stymied by a wall built of nothing more substantial than a wad of paper.—*The Journal of the Medical Society of New Jersey,* February, 1942.